

Helsinki Commission

# REDUCING RISKS OF HAZARDOUS WASTES IN RUSSIA

**BALTHAZAR Project 2009-2010**



Baltic Hazardous and  
Agricultural Releases  
Reduction



This project is carried out with  
funding from the European Union

*Towards enhanced protection of the Baltic Sea  
from mainland-based threats: Reducing agricultural  
nutrient loading and risk of hazardous wastes*

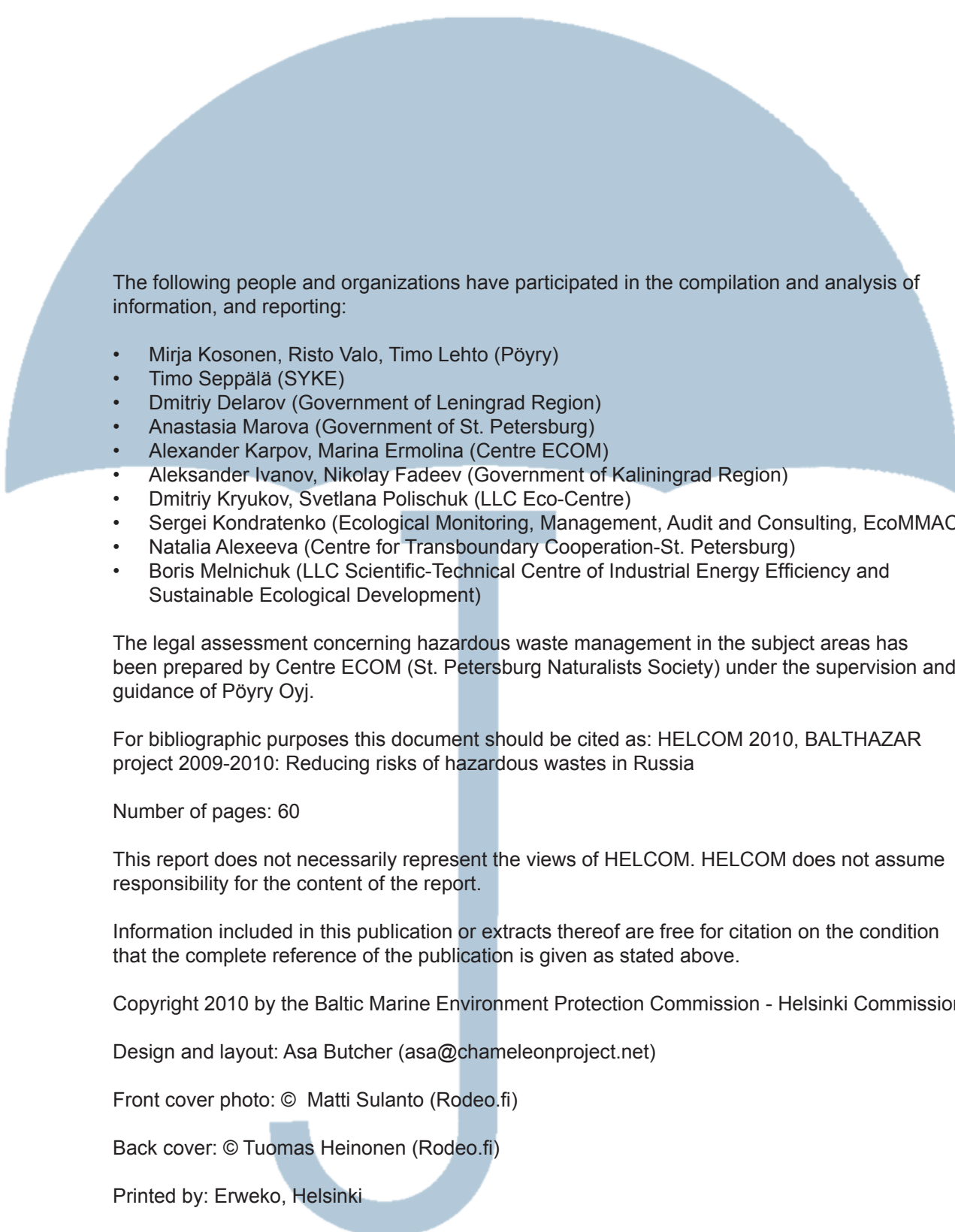


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Helsinki Commission  
Baltic Marine Environment Protection Commission



The following people and organizations have participated in the compilation and analysis of information, and reporting:

- Mirja Kosonen, Risto Valo, Timo Lehto (Pöyry)
- Timo Seppälä (SYKE)
- Dmitriy Delarov (Government of Leningrad Region)
- Anastasia Marova (Government of St. Petersburg)
- Alexander Karpov, Marina Ermolina (Centre ECOM)
- Aleksander Ivanov, Nikolay Fadeev (Government of Kaliningrad Region)
- Dmitriy Kryukov, Svetlana Polischuk (LLC Eco-Centre)
- Sergei Kondratenko (Ecological Monitoring, Management, Audit and Consulting, EcoMMAC)
- Natalia Alexeeva (Centre for Transboundary Cooperation-St. Petersburg)
- Boris Melnichuk (LLC Scientific-Technical Centre of Industrial Energy Efficiency and Sustainable Ecological Development)

The legal assessment concerning hazardous waste management in the subject areas has been prepared by Centre ECOM (St. Petersburg Naturalists Society) under the supervision and guidance of Pöyry Oyj.

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# Abbreviations



<b>BS</b>	<b>Baltic Sea</b>
<b>COD</b>	<b>Chemical Oxygen Demand</b>
<b>CO<sub>2</sub></b>	<b>Carbon dioxide</b>
<b>BOD</b>	<b>Biological Oxygen Demand</b>
<b>DO</b>	<b>Dissolved Oxygen</b>
<b>FSUE</b>	<b>Federal State Unitary Enterprise</b>
<b>HC</b>	<b>Hazard class</b>
<b>HH</b>	<b>Household</b>
<b>HW</b>	<b>Hazardous waste</b>
<b>KO</b>	<b>Kaliningrad Oblast</b>
<b>LF</b>	<b>Landfill</b>
<b>LO</b>	<b>Leningrad Oblast</b>
<b>MAC</b>	<b>Maximum Admissible Concentration</b>
<b>MCW</b>	<b>Mercury containing waste</b>
<b>MPC</b>	<b>Maximum permissive concentration (of a compound in soil/water)</b>
<b>MSW</b>	<b>Municipal Solid Waste</b>
<b>NO<sub>2</sub></b>	<b>Nitrogen dioxide</b>
<b>PAH</b>	<b>Polycyclic aromatic hydrocarbons</b>
<b>PBDE</b>	<b>Polybrominated Diphenyl Ethers</b>
<b>PCBs</b>	<b>Polychlorinated biphenyls</b>
<b>PCDD</b>	<b>Polychlorinated dibenzodioxins</b>
<b>SMEs</b>	<b>Small and medium enterprises</b>
<b>SPA</b>	<b>Sanitary Protection Area</b>
<b>SO<sub>2</sub></b>	<b>Sulphur dioxide</b>
<b>VOC</b>	<b>Volatile Organic Compound</b>
<b>WEEE</b>	<b>Waste Electrical and Electronic Equipment</b>
<b>WWTP</b>	<b>Wastewater Treatment Plant</b>



# Preface



*In February 2009 an agreement was signed between the European Commission (hereinafter the EC) and the Baltic Marine Environment Protection Commission (HELCOM) for the implementation of a two-year project with the subject title 'Towards enhanced protection of the Baltic Sea from main-land-based threats: reducing agricultural nutrient loading and the risk of hazardous wastes. The grant was initiated by the European Parliament (EP) through a newly established Pilot Project Facility. The project was nicknamed 'BALTHAZAR' (Baltic Hazardous Waste and Agricultural Releases Reduction). This report is a product of the work in the agricultural component of the project during the first year of implementation.*

*The overall objective of the BALTHAZAR project is to promote protection of the Baltic Sea protection from hazardous waste as well as from agricultural nutrient loading. Implementation of this pilot project in Russia will facilitate the achievement of the environmental objectives of the hazardous substances and eutrophication segments of the HELCOM Baltic Sea Action Plan through assistance to the development of national action plans and prioritization of necessary measures.*

*The Project will aim at reaching this objective by improvement of management of hazardous and agricultural wastes by piloting environmentally sustainable management measures in the City of St. Petersburg, Leningrad Region and Kaliningrad Region of the Russian Federation.*

*The target group of the Project consists relevant Russian Federal authorities (Ministry of Natural Resources and Ecology, Ministry of Public Health and Social Development, Ministry of Agriculture and their respective federal services (Rosprirodnadzor, Rostekhnadzor, Rospotrebnadzor and Rosselkhozadzor), regional and municipal authorities within the above territories (Governments of St. Petersburg, Leningrad and Kaliningrad Oblasts), as well as the territorial departments of respective federal services and regional and municipal departments and committees for environmental protection, agriculture, water resources. In addition to authorities, industrial (waste-generating and waste management) and agricultural companies, scientific organisations, environmental NGOs and the general public form the project's target group.*

*The implementation period of the project is two years (February 2009-February 2011) and its implementation is overseen by the Delegation of the European Commission to Russia. The Project is managed by the Project Implementation Unit (PIU) established at the HELCOM Secretariat. Practical implementation is carried out by the Russian St. Petersburg*

*Public Organisation "Ecology and Business" as the Russian Partner with the help of individually selected consultant consortiums for specific tasks in the two thematic areas of the project.*

*This report represents the results of the hazardous waste component in the subject areas, the City of St Petersburg and Leningrad and Kaliningrad Regions. The report has been prepared by Pöyry Finland Oy in association with the Finnish Environment Institute. LLC Eco-Centre (Russia), LLC Scientific-Technical Centre of Energy Efficiency and Sustainable Ecological Development (Russia), and several Russian authorities in the City of St Petersburg, Leningrad Region and Kaliningrad Region have provided input data for the report. The legal assessment concerning hazardous waste management in the subject areas has been prepared by Centre ECOM (St Petersburg Naturalists Society) under the supervision and guidance of Pöyry Finland Oy. This report has been approved by the Project Steering Group consisting of representatives from EC, RF Ministry of Natural Resources and Ecology, other Russian federal and regional authorities, international financing institutions and HELCOM Secretariat.*

*We hope that this report will provide the reader an insight to the situation and challenges in the management of hazardous waste in the three Russian regions and will serve as a basis for planning and implementation of improved management measures and investments in more environmentally sound management and treatment of hazardous waste originating from industries, public services and households.*

*Helsinki, Finland  
30 April 2009  
HELCOM PIU*

# Summary

There is little published information available concerning hazardous waste management or formation in Leningrad Oblast, the City of St Petersburg and Kaliningrad Oblast. No comprehensive hazardous waste management strategy or evaluation has been made for the regions in question.

The objective of this project has been to assess the potential sources of hazardous substances from landfills/dump sites, to characterise their environmental risks and to develop measures to reduce the risks of run-off of hazardous substances from waste sites to the Baltic Sea. This inventory and the proposals for pilot projects are based on extensive consultations with the relevant authorities (foremost the environmental authorities, Rostekhnadzor, Rosprirodnadzor) of LO, KO and St Petersburg, on the limited monitoring results available, as well as on information from waste management companies and earlier hazardous waste projects in Russia.

It was possible to quantify different hazardous waste (HW) related sources of pollution for the Baltic Sea on a semi-quantitative basis characterising the HW sources by their importance and relative magnitude, as there was not enough reliable information on hazardous waste types and quantities produced in the regions in question. Monitoring information is available for most of the active landfills, but it is focused on nutrients and heavy metals. In the framework of BALTHAZAR it was possible to screen leachates of some landfills, which showed that landfills are significant sources of contamination. The current monitoring practices are not sufficient to provide reliable information on the impacts of landfills on groundwater or surface water, especially with regard to hazardous substances.

The main challenges concerning hazardous waste management in the priority regions are the lack of environmentally sound hazardous waste treatment technology, lack of collection systems, high amounts of accumulated hazardous waste and incomplete



*A sick stickleback*

implementation of legislation. The environmental authorities of the region have incomplete information on the amounts and types of hazardous waste being formed in the industries and on their disposal, which, in turn, makes it difficult to improve hazardous waste management practices. In addition, the legislation lacks incentives to implement high environmental standards, as disposal in landfills is economically attractive due to the relatively low fees of this type of operation.

Management capacity exists for mercury-containing waste (MCW) and waste oils, although their environmental performance is poorly known. Long-term storage is the available temporary option for most kinds of hazardous waste in St Petersburg and Leningrad Oblast. Industrial solvents, PCB-containing equipment, wastewater sludge and pesticide waste are disposed of in the toxic waste landfill Krasny Bor. Krasny Bor is one of the existing HELCOM Hot Spots and has been identified among the landfills as the highest potential threat to the Baltic Sea in the region by NW Rostekhnadzor. Improved water treatment at the site could be an issue to look at in the future, if possible. In Kaliningrad there is currently no management of the most hazardous wastes.



Although the report concentrates on hazardous waste, some attention was also paid to municipal solid waste (MSW) management. There are 14 MSW landfills in LO and St Petersburg and 39 in KO. In Russia it is not required by law to collect hazardous waste separately from other waste from private citizens or households.

The hazardous waste generated in households and small enterprises can therefore be expected to be disposed of in MSW landfills (estimated amount landfilled could be in the region of 20,000 tonnes). This, in turn, will complicate efforts to manage MSW in an environmentally sound way, including the operation of the incineration plants planned for St Petersburg.

Following consultations with the regional authorities, the report presents 32 priority landfills or hazardous waste storages where better waste management would mitigate the risk of pollution of the Baltic Sea. Thirty of these are active or closed landfills, dumping areas or polygons and two are hazardous waste storages. The risk of these activities has been characterised to the extent possible, even though the information available on the hazardous waste content of landfills was often scanty.

Based on risk characterisation and considerations of project feasibility, the report highlights 13 practical rapid-action projects that would directly reduce pollution of the Baltic Sea. Five of them are supported by the local environmental authorities. The pilot projects proposed based on the study and supported by the authorities are as follows:

Pilot projects proposed for the St Petersburg region are:

- Galvanic waste treatment. Galvanic waste from metal working facilities contains high amounts of heavy metals. Currently it is mainly disposed of in ponds in Krasny Bor without any treatment. The aim of the pilot project is to improve the environmentally sound management of such waste.

- Feasibility/contamination study of the unauthorised Ust-Tosno landfill. This 15 ha landfill contains approximately 400,000 m<sup>3</sup> of waste. The landfill is only partially covered. There is a ring channel immediately surrounding the landfill which leads to the Bolshaya Izhorka River on the catchment of the Baltic Sea. A leachate collection and treatment pilot for Ust-Tosno has also been discussed with the authorities. If the landfill is remediated, the need for leachate treatment would be of temporary nature, but experience would be gained of technical solutions, costs and practical management of treatment, and such a pilot project would be valuable for any similar activity in Russia.

Pilot projects proposed for Leningrad Oblast are:

- Treatment of mercury-containing waste in the Kirpichny Zavod industrial area. There are some 900,000 mercury-containing fluorescent lamps in the area. Due to the past mercury lamp management activities, there is a high possibility of soil or construction contamination.

Pilot projects proposed for Kaliningrad Oblast are:

- Oil storage and ballast water treatment for the port of Kaliningrad. Because of historical contamination, large areas of the site contain high levels of oil in the soil. The pilot project focuses on remediation of the oil-containing soil located by the river flowing into the Baltic Sea. Soil investigations are needed prior to remediation to define the extent of oil in the soil.
- Improvement of mercury-containing-waste management in the Kaliningrad region. Only one enterprise in Kaliningrad Oblast practices treatment of mercury-containing waste. The end product of the treatment is metallic mercury of hazard class I.

# 1 Background



Recently, the Audit Chamber (SP) of the Russian Federation audited the effectiveness of environmental protection in the Russian Federation in the past few years (Gazeta 22-24 May 2009). According to the analysis, one sixth of the Russian territory was classified as being in a critical environmental state. Industrial waste was considered to be the main reason for this. Problems were identified in loss of biodiversity and in particular drinking water quality. The amount of toxic waste in the whole country has been estimated at two billion tonnes.

According to some estimates, Russia produces 75 million tonnes of hazardous waste per year, of which only 18% is recycled (Gazeta, May 22-24, 2009). However, the definition of hazardous waste in the above-mentioned context appears to be very wide, and the figure is fairly high compared to the 180-185 million tonnes of hazardous waste in the country in 1999. The amount of mercury-containing waste in Russia has been estimated at 650,000 to 1,100,000 tonnes, with approximately 11,000 tonnes being generated annually (ACAP 2005).

In the inventory of PCBs in PCB-containing equipment carried out in 2002, the total amount of PCB was estimated at 20,000 tonnes (ACAP 2003). An additional study by AMAP/NEFCO identified about 540 transformers in NW Russia containing about 1,140 tonnes of PCB (NEFCO PCB 2008). The transformers were reported to be mainly located in Karelia, Murmansk Oblast, Vologda Oblast, Leningrad Oblast and St Petersburg area. While all the equipment identified above was largely in use at the time, the PCBs can be expected to enter the waste streams in the following two decades.

According to the Audit Chamber panel, the area polluted with heavy metals and fluorine amounted to 3.6 million ha at the end of 2007, 253 thousand ha of this area being heavily polluted. The main reason identified in the analysis was that the environmental fees for polluting are not high enough to promote better clean-up and waste management.

The overall objective of this project was to protect the Baltic Sea from hazardous waste loading. The specific objective was to assess and identify potential sources of hazardous substances, to characterise the environmental risks generated by these and to develop measures to reduce the risks of hazardous waste substance run-off from waste sites to the Baltic Sea. The project shall provide assistance to federal and local authorities in improving the management and in enhancing the dialogue between the environmental and other relevant sectors.

This study covers both historical and active waste sites in the City of St Petersburg, Leningrad and Kaliningrad Oblasts. The study is based on reports of completed waste management projects and additional information obtained from environmental authorities, databases and newspaper articles.



## 2 General description of hazardous waste management



### 2.1 Introduction

Generally speaking, there is little published information available concerning hazardous waste management or formation in Leningrad Oblast, the City of St Petersburg and Kaliningrad Oblast. The only information available are the annual waste reports to Rostekhnadzor from companies subject to federal control. No comprehensive hazardous waste management strategy has been made for the regions in question. Therefore, the picture of hazardous waste management is based on scattered published information, newspaper articles and interviews with the authorities.

The main challenges concerning hazardous waste management in the priority regions are related to the lack of environmentally sound hazardous waste treatment technology, lack of collection of hazardous waste and inefficient enforcement of legislation. Management capacity exists for mercury-containing waste (MCW) and waste oils, although their environmental performance is poorly known. The environmental authorities of the region have incomplete information on the amounts and types of hazardous waste being formed in the industries and their disposal, which in turn makes it difficult to improve hazardous waste management practices.

Rostekhnadzor is reported to in matters concerning hazardous waste generation and storage. However, this information is not readily available. Detailed - though outdated - information is available only on formation of PCB and mercury-containing waste (ACAP 2003, ACAP 2005). More information on the types and quantities of hazardous waste produced in the regions needs to be obtained before being able to design financially sustainable and environmentally sound management facilities.

In Russia it is not required by law to collect hazardous waste separately from other waste from private citizens or households. Hence hazardous waste is not separately collected

from households and therefore it is not possible to focus strictly on hazardous waste in this context. The hazardous waste generated in households and small enterprises can be expected to be disposed of in municipal solid waste (MSW) landfills. This, in turn, will complicate efforts to manage MSWs in an environmentally sound way, including the operation of the incineration plants planned for St Petersburg.

Nevertheless, the hazardous waste content in MSW landfills is unlikely to create a major pollution source for the Baltic Sea and will not be addressed as a primary source, unless the landfills are very large and located by a watercourse with access to the Baltic Sea, and unless there is specific information available on hazardous waste content.

### 2.2 Legal framework synopsis

The most important elements of the legal framework are presented below. A detailed analysis of Russian federal and regional waste and hazardous waste legislation is given in Annex VI.

#### *Waste legislation in Russia*

The central element for legal regulation of waste management is the federal law "On Production and Consumption Waste." Various provisions concerning waste management are also contained in environmental, sanitary, urban planning, land, civil and other laws. The Russian classification divides waste into five classes from I (extremely hazardous) to V (practically non-hazardous). In most cases, regulations relate to "waste" in general with differentiation by classes.

Regulation of hazardous waste management may be performed by federal legislation only. There is no specific legislation on hazardous waste management. The principal aspects of the hazardous waste management system are determined by about 40 laws, bylaws and

normative-technical documents on federal level. In the new version of the federal law on waste, which came into effect on June 30, 2009, the definition of hazardous waste was removed and the term was replaced with *class I-IV waste*.

#### *Subjects of the waste management system*

Waste management is a subject of environmental (performed by Rosprirodnadzor), sanitary (performed by Rospotrebnadzor) and production control. For enterprises, there are reporting forms designed to control the entire lifecycle of waste, to encourage reduction of waste generation and to provide for charging of environmental fees. Transportation companies and companies engaged in waste disposal (including incineration) and burial are subject to licensing, and projects of disposal plants and landfills are subject to environmental expert reviews (performed by Rostekhnadzor). Control over hazardous waste disposing plants and landfills is performed by the federal authority. Regional authorities may establish and support the hazardous waste management utilities in the region in the framework of environment protection programmes. It is the responsibility of the local authorities to organise collection, transportation, treatment and recycling of industrial and household waste. However, in St Petersburg and in Moscow these powers rest with the regional governments.

#### *Gaps in regulation*

The identified gaps in the hazardous waste management (HWM) regulation can be divided into several categories:

- legal gaps (inaccurate wordings, absence of legal acts stipulated by applicable law, etc.);
- organisational-legal gaps (absence of authority and duties/responsibilities);
- difficulties in law enforcement practices, caused by legal gaps, economic reasons, etc.

The waste classification concept and terminology are complicated as there are two separate classification systems for dividing hazardous wastes into classes of hazard based on the level of adverse impacts either on the environment or on human health. There are no requirements to collect separately wastes with hazardous properties from households and to deliver them to adequate treatment or disposal. Gaps concerning industrial companies are

related to economic motives for violation of law, inefficiency of control and problems with waste recirculation. Transportation and burial seem to be vulnerable stages for violation of law due to insufficient control and difficulties in detecting and investigating environmental crimes. The normative-technical documentation on land-fill and processing plant construction is quite detailed. The differences between the actually built facilities and the design project documentation are a problem of law enforcement rather than of legislation.

The somewhat unclear and changing responsibilities of the authorities contribute to enforcement problems. The authorities do not always have the resources needed to control and inspect enterprises producing or managing hazardous wastes.

The identified major differences as compared to EU regulatory principles are listed below:

- classification of waste into several classes of hazard or toxicity;
- no unique definition of hazardous wastes and specific requirements for their management;
- no producer responsibility for obsolete products;
- no requirements to collect separately hazardous wastes of different classes (except for medical waste). The fee is higher for the more dangerous classes and it is assumed that waste producers are stimulated not to mix wastes of different classes to avoid increase of disposal fees.
- separate collection of household waste with hazardous properties is not required;
- landfills are classified in a different way from the EU. In Russia they are classified as municipal solid waste landfills and hazardous waste landfills. Hazardous waste landfills may be specialized into classes I-II, or III-IV, or other combination. In the EU, there are three types of landfills: for hazardous waste, for non-hazardous waste and for inert waste;
- different technical requirements for landfill bottom and surface structures, monitoring and closure.

### **2.3 Examples of problems in enforcement of legislation**

Based on the inventories made in BALTHAZAR, it is evident that there are deficiencies related to environmentally sound management of certain

waste types (e.g. waste oil), waste sources (hazardous waste from households) or waste disposal (illegal dumping, lack of environmentally sound treatment/disposal technologies). In some cases this can be considered a result of lack of regulations (separate collection of hazardous waste, lack of special requirement on landfill monitoring, etc). In some cases the legislation is in place but there are challenges in enforcement, control and motivation (i.e. penalties for violating the legal requirements). However, Kaliningrad Oblast provided also detailed figures of successful use and enforcement of legal instruments, which are referred to below.

Various reasons may lead to inadequate enforcement of regulations. Often the authorities do not have the resources needed to control and inspect enterprises producing or managing hazardous waste. For example, enterprises are entitled to store a certain amount of hazardous waste in their company premises for a given time, but the authorities do not have the possibility of controlling the storage period or waste amounts. Consequently, enterprises may hold excessive amounts of waste in their territory for an indefinite period. Without reasonable control, enterprises may dispose of their hazardous waste in ways that are not even known to the authorities (e.g. waste oil in St Petersburg). In addition, longer-term storage threatens the sustainability of waste management companies. A good example of the work load is St Petersburg where 40 environmental inspectors should control 50,000 enterprises.

The situation could be improved by introducing special administrative procedures and guidance of environmental control performance. This would be helpful in determining staff numbers and other resources necessary for enforcement operations.

In Kaliningrad Oblast the situation appears to be better. An Information System of Waste Management (ISWM) introduced according to the Law of Kaliningrad Oblast "On Production and Consumption of Waste" (of 02.11.2007 №177) and the Administrative Offence Code of Kaliningrad Oblast (KoAP KO, Article 80). The ISWM contains 200 enterprises registered for waste reporting, which helps the inspectors in carrying out their control activities. The waste management inspection activities are reported to the Governor of KO weekly. Incompliance of the companies with the regulations and fines are also published weekly in Kaliningrad Pravda. However, also KO has noted the reluctance

of enterprises to register to the system. Since the beginning of 2009, 5025 reports about violations of waste management legislation have been made.

Kaliningrad Oblast has also approved a Target Programme "Environmental Improvement of the Kaliningrad Oblast Area in 2008-2012". The programme has been developed for stabilisation and improvement of the environment, prevention of degradation and conservation of natural complexes in Kaliningrad Oblast. One of the nine "hot spots" in the programme is waste management. The programme identifies incompliance of the functioning landfills with sanitary and ecological requirements, the growing number of illegal dumps and the amount of illegally disposed waste as serious ecological problems.

The Territorial Department of Rospotrebnadzor has actively enforced sanitary legislation. Decree № 4 of the Chief Sanitary Inspector of February 22, 2008 notes that all landfills do not meet hygienic requirements and sets a schedule for making landfills meet sanitary standards, giving deadlines and appointing responsible persons for every municipality. In 2009, as a result of inspections of municipal solid waste landfills and sites for temporary waste storage, 17 reports about administrative offences were made and six fines to the total sum of 111,000 rubles (~2,800 euros) had been imposed on officials and legal entities.

The Office of the Public Prosecutor of Kaliningrad Oblast also participates in the enforcement of environmental and sanitary legislation. In their activities during 2007-2009, a large number of violations were found:

- enterprises working without the necessary "Draft of Waste Generation Norms and Disposal Limits" issued by the authorities;
- enterprises without hazardous waste passports and permissions for emission of harmful substances into the atmosphere;
- enterprises avoiding the compensation for negative impact on the environment;
- enterprises not fulfilling the industrial ecological control;
- hazardous waste management enterprises operating without license. For example, a company has been fined 40,000 rubles for not having a license for management of class IV waste.

There are special Environmental Prosecutor's offices in St Petersburg and Leningrad Oblast

<sup>1</sup> Article 247 of the Criminal Code

as well, but through recent changes in legislation they have lost the right to investigate relevant cases; they can only bring them to court based on the evidence obtained by other authorities.

The unclear and changing responsibilities of the authorities contribute to the enforcement of problems in many other regions. The legislation does not clearly stipulate the responsibility of the regional authorities in the treatment/disposal of hazardous waste. Some enterprises are under Rostekhnadzor control, some under regional authorities (city, oblast). Some operations are controlled by Rosпотребнадзор and some by Росприроднадзор. Municipalities are responsible for the collection, transportation and disposal of both industrial and domestic waste, but their responsibilities for hazardous waste management are not defined. As the hazardous waste management legislation is scattered both in federal and in regional legislation and restructuring of the administration takes places frequently, the authorities on different levels may have difficulties in understanding their responsibilities and especially, due to the potentially changing situation, to secure sufficient resources for them.

Waste generator responsibilities have been clearly set out. However, some regulations are burdensome and may encourage waste management violations (e.g. selling the raw wood waste to a person without a license for waste management is illegal) and in some cases it may be impossible to comply with the regulations due to the lack of environmentally sound waste management capacity and technology (e.g. high-temperature incineration, galvanic waste chemical treatment).

Environmental law violations are difficult to investigate and violators may therefore not be afraid of penalties. There are no established mechanisms for co-operation between Rostekhnadzor, Росприроднадзор and the police. However, when such co-operation can be established, as the Kaliningrad Oblast examples above show, results are promising and violators can be brought to justice. Naturally bigger economic areas such as St Petersburg would still be challenging to control.

The liability for hazardous waste differs from the European approach, where the responsibility follows the waste. In Russia the subject of a criminal liability for violation of hazardous waste treatment regulations is the person responsible for compliance with the hazardous

waste treatment regulations in the organisation<sup>1</sup>. If the offence was committed by someone else, this person may not be held responsible for inappropriate waste management.

Finally, the penalties for violation of hazardous waste management legislation may not be high enough to motivate environmentally sound management, leaving the authorities powerless even in cases when violation is identified. Most offences that can cause serious harm to the environment, including landfill operations, are punished by fines and suspension of operation. Administrative punishments do not include stronger economic incentives, such as property confiscation.



# 3 Inventory of hazardous waste sites



In this context the term “hazardous waste sites” means any site containing significant amounts of hazardous waste, including hazardous waste landfills (polygons), treatment facilities, storages and collection points that could potentially release hazardous substances into the environment. The Russian legislation does not make any clear distinction between regular municipal solid waste (MSW) and hazardous waste. In Russia all wastes are classified into hazard classes (HC) I to V. Classes IV to V contain, in practice, low- or non-hazardous waste that could be classified as common MSW.

Wastes of classes I to III contain hazardous compounds and waste that contains toxic or reactive harmful substances or agents that pose a threat to human health or to the environment. As in the EU, the classification is based on a list maintained by the government (the Federal Classification Catalogue of Waste), which enterprises use to define the class of waste they produce to dispose of it appropriately. The system is described in detail in the Legislation Analysis in a separate report.

This inventory aims to focus on HC classes I to III in the cases where detailed information on waste composition is available. This is, however, difficult to achieve as the composition of waste sites is known only in very few cases. The classes in question are defined in the respective legislation as:

- **Class I:** Extremely hazardous waste (e.g. containing mercury);
- **Class II:** Highly hazardous waste (e.g. containing lead, remnants of hydraulic oil, technical devices containing halogens that have lost their consumer properties);
- **Class III:** Moderately hazardous waste (e.g. containing copper, remnants of silicon oils or diesel fuel).

## 3.1 City of St Petersburg

The City of St Petersburg has some five million inhabitants. The area is 600 km<sup>2</sup>, and with the administratively subordinated territories 1,439 km<sup>2</sup>. St Petersburg has a lot of industry: it is the second largest manufacturing centre of Russia after Moscow with many industrial activities producing hazardous waste. St Petersburg is the ship-building centre of Russia and has numerous metal-working, chemical, petrochemical and forest industry enterprises. Many of these fields of industry are commonly known to produce hazardous waste in their normal operation.

### 3.1.1 Hazardous waste generation

Estimating hazardous waste generation in St Petersburg is very difficult, because the responsibilities of federal authorities, regional authorities and enterprises are not clearly defined. The City Environment Committee estimated the amount of hazardous waste generated being between 15,000 and 40,000 tonnes annually. This estimation, however, is very approximate. According to the waste authorities, the amount of hazardous waste is 67% of the total waste formation, i.e. 85,000 tonnes. Different classification may explain why these two estimates diverge.

Some statistical information is available from enterprises reporting to the regional Rostekhnadzor according to the 2-TP “Waste” reporting forms dating back to the Soviet times. The majority (90%) of the 200-300 companies producing hazardous waste are controlled by the NW Russia Rostekhnadzor and the small- and medium-sized enterprises by the Environmental Committee of St Petersburg. It has been estimated that the Rostekhnadzor controlled companies are responsible for 80-90% of the hazardous waste generated.

The NW Russia Rostekhnadzor creates statistics based on hazard class (HC). The Environment Committee of St Petersburg

**Figure 1a:**  
Ekostroi mercury lamp  
treatment in Krasny Bor.  
(Photo: © Risto Valo)



**Figure 1b:**  
Ekostroi mercury lamp  
containers used for disposal of  
glass waste in Krasny Bor.  
(Photo: © Risto Valo)



carries out their own more detailed analysis of company reports.

According to waste reporting, the amount of waste produced by the 512 enterprises reporting in 2008 totalled 4,358,000 tonnes. Less than 30,000 tonnes of the waste belongs to hazard class I-III. About 82% of the HC I waste was mercury-containing lamps and 58% of the HC II waste metal and galvanic sludges.

I class of hazard: 1,174 tonnes  
II class of hazard: 860 tonnes  
III class of hazard: 27,000 tonnes

The Environment Committee analysis raises concerns over the quality of reporting and concludes that it is not sufficient to estimate hazardous waste formation. There is a large variation in both annual waste amounts (2007 HC I: 371 t, 2008 HC I: 1174 t) and in the number of companies reporting (2007: 200 companies, 2008: 512 companies).

Ten years ago the amount of oil waste generated in St Petersburg accounted for 70% of all hazardous waste. Currently it is not known how waste oils are collected or treated, although a number of companies provide waste oil services. In 2000, the PCB-containing equipment in the NW region and Kaliningrad was estimated at approximately 1,200 tonnes (ACAP 2000), which can be assumed to enter the waste phase in the near future.

Creating mass balances for hazardous waste generation is difficult, because many compa-

nies have hazardous waste storages of their own where they are allowed to store hazardous waste formally temporarily for a period of up to three years. However, the authorities have noted that this time limit cannot be controlled and the respective restrictions enforced.

Information on hazardous waste is expected to improve when the Environmental Committee launches the new data collection for hazardous waste register. This will, however, only concern SMEs under their own authority.

### 3.1.2 Hazardous waste from households

The Russian legislation contains no specific regulations for separate collection, transportation, disposal or treatment of hazardous waste generated by households. St Petersburg does not currently collect hazardous waste separately from households. Consequently, the hazardous waste fraction generated in households (fluorescent lamps, paints, waste oils, mercury thermometers, electronic waste) is disposed of within the MSW in landfills. However, in December 2009 the Environment Committee started a pilot collection of fluorescent lamps in one of the city districts. The collection is expected to continue in 2010.

In 2006-2007, the Environmental Committee of St Petersburg and St Petersburg State Polytechnical University carried out a waste morphological study of MSW in the Kalininsky district in collaboration with the City of Turku (Chusov, 2007). Despite the hazardous waste content having been specifically addressed in the study, the reports, however, do not reveal the possible amounts of hazardous waste in the MSW. Some sources report the hazardous waste content being as high as 6% of the MSW, containing batteries, WEEE, heavy metals, etc. (Loseva, 2007). This figure, however, appears too high.

Based on information available from Finland on hazardous waste of household origin, it could be estimated that households produce 3-5 kg/year/person of hazardous waste. For St Petersburg this would mean approximately 15,000-25,000 tonnes of hazardous waste landfilled annually – almost equal to the hazardous waste produced by industry.

### 3.1.3 Hazardous waste management in the region

Thirteen companies in St Petersburg and Leningrad Oblast provide disposal of waste.

Only one of these (SUE Polygon Krasny Bor) provides disposal of hazardous waste. The remaining 12 companies are licensed to provide disposal of MSW, industrial waste of HC IV and V class and inert HC III waste. Two other state-owned companies (Ekostroi and Spetstrans) and a number of private companies in St Petersburg provide hazardous waste collection and storage services for hazard classes I-IV and treatment of waste oils (six companies). There is little information available on their operation, but some of the storage (such as storage of mercury from fluorescent lamp treatment) might be a substantial reservoir of hazardous substances. A list of companies dealing with waste management and storage is presented in Annex V.

St Petersburg has two facilities dealing with treatment of mercury-containing waste, in practice, fluorescent lamps and mercury thermometers. Ekostroi, located close to one of the major landfills, treats 500,000-600,000 fluorescent lamps annually, creating 1,500 kg mercury-containing waste for disposal at Krasny Bor (Figure 1). It is to be noted, however, that currently Russia has not approved any technology for the final disposal of stabilised mercury from the recovery processes and many companies recycle the end product to the mercury market without stabilisation.

In St Petersburg fluorescent lamps are collected for treatment only from industries and public institutions, such as hospitals, and the mercury-containing waste from households is landfilled as MSW. According to the authorities, separate collection of fluorescent lamps has been tried, with disappointing results.

There are challenges in the hazardous waste management of the industry in the region. According to the findings in a recent Greenpeace report (Greenpeace 2008), electrical and electronic goods manufacturers discharged significant amounts of heavy metals into the Okhta and Neva Rivers. In addition, PBDEs, phthalates, volatile organic compounds (VOC) and other chemicals were found in wastewater and sediment samples indicating hazardous substances emissions from industrial activities in the catchment area of the Baltic Sea (cf. monitoring results Chapter 3.1.9). It is to be noted, however, that the majority of electronics manufacturers discharge their wastewaters into the collection system to be treated at a wastewater treatment plant. In this process many chemicals can be expected to be bound in the sludge.



**Figure 2:**  
Waste disposal on a dumpsite.  
(Photo credit: Timo Seppälä, SYKE)

### 3.1.4 Krasny Bor polygon

The Krasny Bor polygon, operated by St Petersburg City, is located approximately 45 km from the city centre in Kolpino. It was founded in the late 1960s to “maintain the ecological balance in the region” due to heavy industrialisation. The site was chosen based on extensive exploration in Lomonosov, Pushkin, Vsevolozhsk, Volkhov and Tosno districts. According to the founding justification, Krasny Bor in Leningrad Oblast territory was chosen based on:

- favourable geological conditions i.e. thick layers of Cambrian clay as a bottom structure preventing the entry of toxic substances into the groundwater;
- absence of aquifers used for water supply;
- no seasonal flooding;
- optimal distance from human settlements and industrial enterprises - sources of waste.

The business idea of the Krasny Bor polygon is neutralisation and burial of industrial toxic waste from Leningrad Oblast and St Petersburg enterprises. The polygon accepts the following types of waste:

- Liquid inorganic waste (such as surface treatment facility galvanic waste);
- Liquid organic waste (resins, solvents, petroleum products, etc.);
- Solid and pasty organic and inorganic waste (sludge from electroplating industry, oil-contaminated soil, etc.);
- Very hazardous HC I waste (waste containing mercury, cyanide, arsenic, cadmium and other potent toxic substances).

The treatment of liquid waste is based on minimising by removing the water component. Then the remaining solid fraction of waste is



**Figure 3:**

Handling of used lamps.

(Photo credit: Risto Valo, Pöyry)



buried in the clay. Waste compaction by evaporation is done in a thermal facility at a temperature of 600°C. Since becoming operational in the early 1970s, the polygon has accumulated approximately 1.7 million m<sup>3</sup> of hazardous waste of different classes in an area of 50 ha. Historically Krasny Bor has been the primary dumping place for hazardous waste from the NW region and contains high amounts of accumulated waste. Complete information on the contents of the polygon ponds is not available; however, it is known to contain at least 100 t of mercury (ACAP 2005), obsolete pesticides from Leningrad Oblast and six other Russian regions (Draft Integrated Strategy for Management of Hazardous Waste in the Northern Region of Russia 2009), PCB transformers and capacitors from the region and waste oils from the industry in Leningrad Oblast.

According to the regulations and approved limits, the State Unitary Environmental Protection Enterprise Krasny Bor does not discharge wastewater into surface water bodies. All storm and drainage waters from the landfill area are collected into reservoir cells and then evaporated at thermal treatment facilities. Krasny Bor has a monitoring programme covering air, soil and plant monitoring. In addition, the surrounding population is subject to “health and immunity monitoring”. Groundwater is not monitored.

Based on the report received from the St Petersburg authorities, the monitoring data from Krasny Bor show elevated levels of heavy metals in the surrounding area in soil, though the norms are not often exceeded. Typically for the Russian environmental regulations, air concentrations are measured outside the protection zone: five substances (sulphur anhydride, nitrogen peroxide, phenols, formaldehyde, sulphuric acid aerosol) are monitored in the nearby villages 2 km from the facility. It is worth noting that volatile organic compounds

or e.g. mercury are not monitored in the air or any other media and that the environmental concentrations in the area relatively far from the facility itself may be affected by other nearby industry.

Currently the Krasny Bor polygon receives 12,000-15,000 t/a of hazardous waste from the city of St Petersburg and Leningrad Oblast only. Comparing the estimated generation of hazardous waste in the region, it seems clear that other means of disposal are used for up to 25,000 tonnes in St Petersburg (not including waste oils).

Krasny Bor can be considered the largest potential threat to the Baltic Sea because of its high amounts of accumulated hazardous waste.

### 3.1.5 Municipal solid waste (MSW)

There are currently only two operational MSW landfills for the City of St Petersburg, Novoselki and Volkhonka (located in the LO area). Volkhonka (PTO-1, operational since 1978) receives 30% of all solid waste generated in St Petersburg. Samples taken from the surrounding swamp water and sediment showed PBDE, PAH, chlorinated benzenes and other hydrocarbons contamination suggesting contaminants transportation from PTO-1 landfill waste to the surrounding environment (Greenpeace 2008). The amount of leachates from the Novoselki and Volkhonka landfills is estimated at 200,000 m<sup>3</sup> annually.

A comprehensive, though to some extent outdated, study on St Petersburg waste management (Florinskaya et al, 2002) estimates the total MSW generation in the city at over one million tonnes, of which 70% (770,000 t) is landfilled directly in large landfills. The remaining part (approximately 290,000 t) is treated at private waste treatment/ recycling facilities (such as SpetsTrans<sup>2</sup> employing 1,100 people), where some reusable fractions (metals, plastics, organics) can be separated manually onto conveyor belts.

According to the Russian BALTHAZAR consultant (LLC Eco-Centre), the amount of waste treated in these recycling plants is much higher, 1.7 million tonnes, exceeding the amount of MSW landfilled. It has been reported, however, that nearly all the material composted in the waste treatment plants must be landfilled due to the poor quality of the product (Lappalainen & Kouvo 2004). Hazardous waste

<sup>2</sup> [www.spest.ru/technol/technolotb.htm](http://www.spest.ru/technol/technolotb.htm)

is not separated from the waste at the facility, even though it would be technically possible in the same way as other fractions are separated as secondary raw materials.

### 3.1.6 Medical waste

Russian regulations on medical waste are targeted to deal with epidemiological threats. Medical waste represents a special fraction of hazardous waste due to its health and environmental risks being associated with biological threats and emissions from waste management (such as incineration releases rather than intrinsic properties of the waste itself). Some of the medical waste fractions (such as obsolete pharmaceuticals and mercury-containing instruments) should be disposed of as industrial toxic waste, while others can be landfilled or buried.

There are no specific facilities in NW Russia licensed for disposal of healthcare waste. It is known, however, that Leningrad Oblast clinical hospital in St Petersburg operates a hospital waste incinerator and some plastics are disposed of by some specialised enterprise. Mostly Class B medical waste is disposed of in MSW landfills after disinfection.

The amount of medical waste produced in the city has been estimated at 40,000 tonnes a year. There are 130 hospitals, 391 polyclinics, three blood transfusion stations, five research institutes of emergency aid, 13 research medical institutes, 13 children's homes, 13 boarding houses for elderly people, 23 sanatoria, 14 medical boarding houses, 32 sanitary institutions, nine medical schools, 270 pharmacies, three laboratories and nine forensic medical examination institutions in the city.

In addition, more than 700 private licensed institutions of medical specialisation are registered, as well as hundreds of first-aid stations at schools, kindergartens and enterprises. All these institutions are potential sources of medical waste. According to the Russian source, the volume of hazardous and radioactive medical waste in St Petersburg is approximately 10% of the total amount of medical waste, i.e. 4,400 tonnes a year (LLC "Eco-Centre").

On the initiative of the executive public authorities of St Petersburg, the "Scheme of Medical Waste Handling in St Petersburg" was developed under a project of the EU Life Programme. Regional sanitary standards and standard

instructions for the medical personnel involved in medical waste handling were developed and put into effect. The PREUSSAG - Stericomat plant was purchased for treatment of hazardous medical waste in the northern part of the city. Low-capacity incinerators also operate at the bureaus of forensic medical examination of the Leningrad Region, St Petersburg Medical University and City TB Hospital No.2.

### 3.1.7 Waste electric and electronic equipment

Waste electric and electronic equipment is not considered as hazardous waste nor separately collected in Russia. There are, however, facilities (e.g. Ekostroi) dedicated to dismantling electronic equipment and to separating metals and plastic for recycling (Figures 4).

In addition, unauthorised small-scale recycling activities through incineration are known to take place on three sites in St Petersburg (Greenpeace 2008) contaminating the soil and surrounding environment with air emissions, heavy metals and flame retardants. This may be partially explained by the high price level for recycling in dedicated facilities in St Petersburg. The recycling fee may rise to thousands of euros, which may not promote the use of environmentally sound official activities.



**Figures 4a & 4b:**  
Waste electronic and electrical  
equipment recycling in St  
Petersburg.

### 3.1.8 Illegal waste disposal

Little information is available on illegal waste disposal in St Petersburg or old hazardous waste burial sites. In the vicinity of Krasny Bor, an illegal dumping site, Ust-Tosno, contains 400,000 m<sup>3</sup> of waste in an area of 15 ha (Figure 5, Figure 6). It has been remediated (covered with soil) in the past. However, according to the authorities, the remediation has been incomplete. A channel surrounds the dump collecting leachate first to the Bolshaya Izhorka River and finally to the Baltic Sea. In the BALTHAZAR project, samples were taken in the ring channel. The concentrations of contaminants were not alarming. However, MAC<sup>3</sup> were exceeded for phenols.

### 3.1.9 Landfill monitoring

Landfills are monitored by the Federal Service for Hydrometeorology and Environmental Monitoring under the Ministry of Natural Resources and Ecology. According to Rospirodnadzor, the monitoring network is not extensive and data are scattered.

Some screening results are available for Volkhonka (Figure 7) and Novoselki landfills.

Water from a ditch passing the Volkhonka landfill was analysed in 2008 for metals (Fe, Cr, Pb, Ni, Zn, Mn, Cu, Cd, Sb, Be, V, Ba, As, Hg), nutrients, inorganic salts, phenols, surface-active

substances (SAS), volatile organic compounds (BTEX, isopropylbenzene, trimethylbenzene) and dissolved solids. Maximum admissible concentrations (MAC) were reference concentrations. The following parameters exceeded the MACs:

	Concentration (mg/l)	MAC (mg/l)
1. Ammonium	378-449	1.5
2. Phosphorus	11-23	0.2
3. Hydrogen sulphide	1.9-2.3	0.05
4. Inorganic chloride	874-975	350
5. Iron	2.7-2.8	0.3
6. Chromium	0.28-0.31	0.05
7. Lead	0.038-0.047	0.01
8. Nickel	0.13-0.16	0.02
9. Manganese	0.55-1.44	0.1
10. Phenols	0.125-0.205	0.001
11. SAS	1.4-1.6	0.5
12. Dissolved solids	10,000-11,000	1,000

At Novoselki landfill water from a nearby ditch was analysed in 2007 at two points, located 100 m and 200 m downstream from the landfill. The analysed compounds were metals (Fe, Al, Pb, Ni, Zn, Mn, Cu), COD, phenols and non-ionic (NSAS) and anionic (ASAS) surface-active substances. All compounds except lead and phenols exceeded the MAC:

	Concentration (mg/l)	MAC (mg/l)
Copper	0.24-0.40	0.006-0.009
Nickel	0.16-0.21	0.01
Zinc	0.25-0.35	0.02-0.04
Iron	3.1-4.5	0.22-0.43
Manganese	0.8-1.2	0.1
COD	970-1,580	30
NSAS	0.5	0.1
ASAS	0.8	0.1

The results indicate that leachate from the landfills contains high levels of ammonium and phosphorus as well as heavy metals chromium, lead, nickel, copper and zinc. Also the organic loading (COD) as well as surface-active compounds are high in leachate.

Monitoring of selected landfills was carried out as part of the BALTHAZAR project. Water samples were taken at four landfills (Ust-Tosno, Primorskaya, Novoselki and Volkhonka) in November 2009 (Figure 8). A summary of the results is presented in Tables 1 and 2 and the sampling locations in Appendix VIII.

Concentrations of several heavy metals (nickel, cadmium, lead, chromium and arsenic) in landfill leachate exceeded the local and/or EU quality standards. Phenols in all leachates were higher than the local standard. Oils,



<sup>3</sup> MAC = Maximum Admissible Concentration of Chemical Substances Contained in Water of Water Bodies for Drinking and Household Water Use.

**Figure 5:**

Ust-Tosno illegal landfill in Kolpino. The surrounding pond collects the water. (Image: © Google Maps™ mapping service)

**Figure 6:**

Illegal excavations are still taking place at the Ust-Tosno landfill. (Photo: © Timo Seppälä)



PCBs, dioxins and polybrominated diphenyl ethers were present in nearly all samples although not exceeding the standards. These results indicate that hazardous compounds are present in all screened landfills and that they leach into the environment.

One sediment sampling was performed in the Ichora River. The site was about 3 km downstream from the Gatchina landfill. The results are shown in Table 2. The concentrations of several PAH compounds (naphthalene, phenanthrene, benzo(a)pyrene and benzo(k)fluoranthene) were elevated as compared to European or Russian reference values. PBDEs and PCBs that were typical compounds in landfill leachate were also found in the sediment.

### 3.1.10 Priority hazardous waste sites

Based on the information available on the contents and locations of the landfills and other sites where hazardous waste has been managed in St Petersburg, the most important sites were selected for further analysis (Figure 9). Some of the sites are located in the territory of Leningrad Oblast, but since they are controlled by the St Petersburg authorities, they have been included in the St Petersburg inventory.



**Figure 7:**  
Volkhonka landfill 5.11.2009 during new sampling, a ditch surrounding the landfill.  
(Photo: © Risto Valo)

Seven priority sites are closed landfills, which either have been managed or are illegal. There is very little data on the contents of these dumps, some of which were closed as early as in the 1960s and 1970s. Especially very old dumping areas, operational prior to the Krasny Bor polygon, have a high potential of containing hazardous industrial waste. There were no monitoring data available on them. A good example of such a dump is Primorskaya (Figure 10), which was operational from the 1960s to the 1990s and is located close to a settlement. It does have leachate collection, but no treatment, therefore potentially polluting the Baltic Sea. According to the authorities the amount of leachate is very small.

Chemical	Unit	Ust-Tosno	Primorskays	Novoselki <sup>1</sup>	Volkhonka	Russian MAC <sup>2</sup>	EU EQS <sup>3</sup>
pH		6.6	7.4	7.6	7.5	6.5-8.5	
Electric conductivity	mS/m	4.9	3	4.9	14.8		
Oil hydrocarbons	mg/l	0.32	0.27	0.3	0.34	0.3	
Phenols. total	mg/l	0.012	0.01	0.015	0.024	0.001	
Chlorophenols (10 compounds)	mg/l	<0.0005	<0.0005	<0.0005	<0.0005		
Ni	mg/l	0.006	0.029	0.072	0.23	0.02	0.02
Zn	mg/l	0.045	0.012	0.016	1.1	1	
Cd	mg/l	0.00013	0.00008	0.00033	0.0017	0.001	0.00008-0.00025
Cu	mg/l	0.006	0.016	0.003	0.24	1	
Co	mg/l	<0.001	0.004	0.009	0.024	0.1	
Pb	mg/l	0.003	<0.001	0.006	0.045	0.01	0.007
Cr	mg/l	0.02	0.009	0.24	1.2	0.05	
Hg	mg/l	<0.00005	<0.00005	<0.00005	0.0001	0.0005	0.00005
As	mg/l	<0.002	0.008	0.011	0.029	0.01	
PAHs. sum of 16 compounds	µg/l	< 0.02	<0.02	0.049	<0.02		
BTEX	µg/l	<5	<5	<5	<5	benzene 1	benzene 10
Polybrominated diphenyl ethers. sum of 18 compounds	pg/l	8.3	14.6	187	158		500
Total cyanide	µg/l	<1	<1	1.1	4.45	35	
Endosulphane	ng/l	<0.1	<0.1	<0.1	1.11		5
PCB. sum of 14 compounds	ng/l	0.4	0.14	19	123	500	
PCDD/F, I-TEQ	pg/l	0.321	n.d.	2.21	19.8	20	
Chlorinated aliphatics and aromatics. sum of 27 cmps.	µg/l	<d.l.	1.55	0.33	12.16		

<sup>1</sup> ditch 100 m downflow from landfill

<sup>2</sup> MAC = Maximum Admissible Concentration

<sup>3</sup> EU Quality Standard for inland surface water (<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0084:0097:EN:PDF>)

The flow rate of Novoselki sampling ditch (November 2009) was calculated at approximately 100 liters/second.

**Table 1:**  
Results of landfill monitoring in St Petersburg and LO in November 2009.

**Table 2:**  
Results of Ichora River  
sediment monitoring in  
November 2009, site  
downstream from  
Gatchina landfill.

Chemical	Unit	Result	Finnish sediment level 2 <sup>1</sup>	Russian MAC (AAC)
pH		7.2		
Oil hydrocarbons	mg/kg	97	1,500	
Phenols, total	mg/kg	<0.0005		
Chlorophenols (10 compounds)	mg/kg	<0.002		
Ni	mg/kg	4.3	60	4.0 (80)
Zn	mg/kg	24	500	23 (220)
Cd	mg/kg	2.3	2.5	2
Cu	mg/kg	13.2	90	3 (132)
Co	mg/kg	0.8		5
Pb	mg/kg	2.8	200	32 (130)
Cr	mg/kg	10.3	270	6
Hg	mg/kg	<0.003	1	2.1
As	mg/kg	0.5	60	2 (10)
Naphthalen	mg/kg	4.3	0.1	
Acenaphthylen	mg/kg	<5		
Fluorene	mg/kg	<2		
Acenaphthemn	mg/kg	<5		
Phenantren	mg/kg	8.2	0.5	
Antracen	mg/kg	<1	0.1	
Fluoranthene	mg/kg	<1	3	
Pyrene	mg/kg	<1		
Benzo(a)anthracen	mg/kg	<1	0.4	
Chrycen	mg/kg	2.4	11	
Benzo(b)fluoranthene + perylene	mg/kg	46		
Benzo(k) fluoranthene	mg/kg	4.7	2	
Benzo(a)pyrene	mg/kg	3.7	3	0.02
Dibenzo(ah)anthracene	mg/kg	<1		
Indeno(123)pyrene	mg/kg	<1	6	
Benzo(ghi)perylene	mg/kg	<	8	
PAHs, sum of 16 compounds	mg/kg	69		
BTEX	mg/kg	<5		benzene 0.3
Polybrominated diphenyl ethers, sum of 18 cmps.	ng/kg dwt	60.4		
Total cyanide	µg/kg dwt	0.049		
Endosulphane	µg/kg dwt	0.25		
PCB, sum of 14 compounds	µg/kg dwt	0.64		
PCDD/F, I-TEQ	pg/g dwt	n.d.	500	
Chlorinated aliphatics and aromatics, sum of 27 cmps.	µg/kg dwt	0.78		

<sup>1</sup> If sediment level 2 is exceeded, sea-banking of dredged sediment is forbidden. The values are for normalised sediment. Finnish Ministry of the Environment, 2004.

St Petersburg currently operates two very large MSW landfills in the territory of LO. Volkhonka (Figure 11) and Novoselki are both 65-70 ha and are estimated to contain seven million tonnes of MSW. Their leachates are partly collected and treated by a sedimentation

process. However, neither of them has an artificial bottom structure, as they were founded in the 1970s. Novoselki will be closed in 2014.

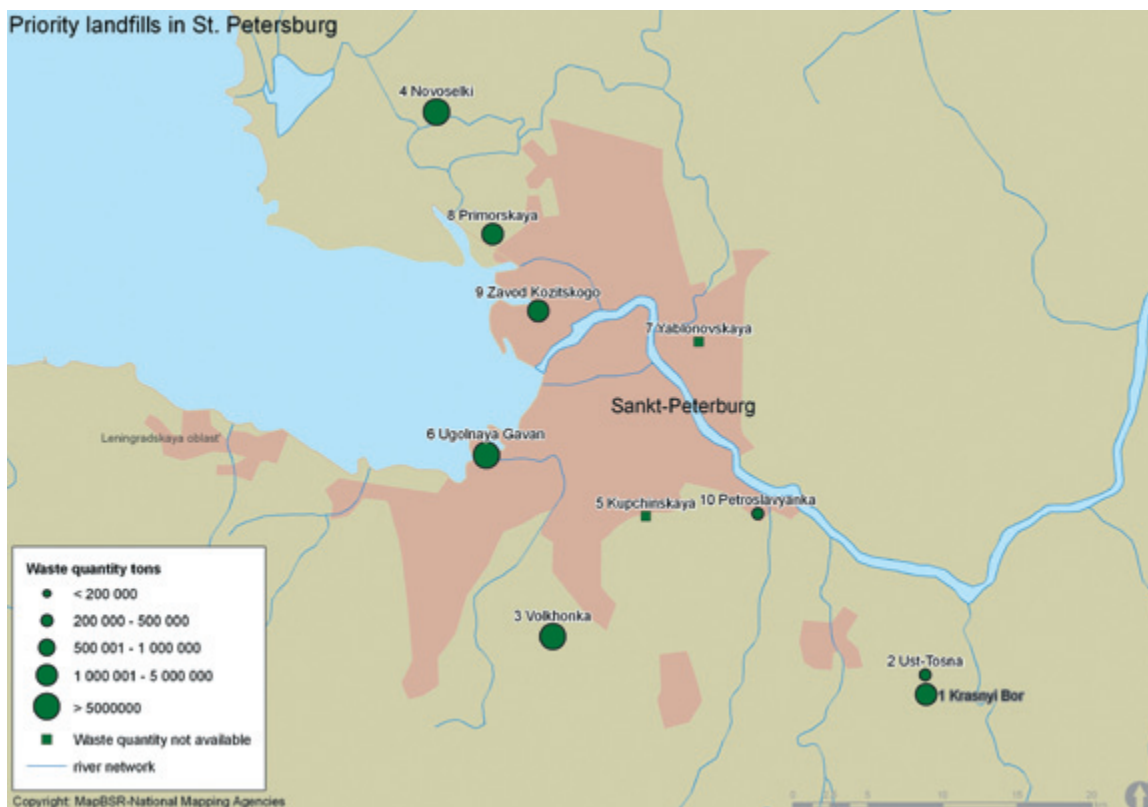
Krasny Bor industrial landfill is the most important hazardous waste site and a potential threat to the Baltic Sea, based on the large amount of industrial waste (1.7 million tonnes) placed on the site. It has, however, a natural bottom structure due to geological clay formations which appear to be impermeable.

There are some concerns over the excess water treatment, which is being pumped from the ponds filled with various hazardous chemicals. In addition, some unofficial reports and unconfirmed information suggest pond leakage. Actions related to water treatment or monitoring practices could be looked at in the future, if there is a change in the circum-

**Figure 8:**  
Leachate sample from  
a ditch flowing by the  
Novoselki landfill  
05.11.2009.  
(Photo: © Risto Valo)







**Figure 9:**  
The most important waste sites of St Petersburg.

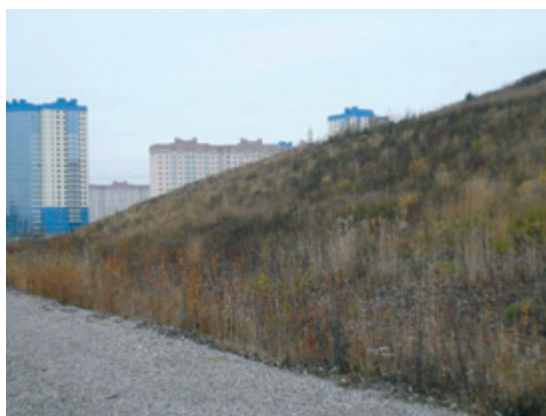
stances. The facility has already developed a water treatment concept but financial arrangements are yet to be determined.

In general, there was very little information available on the contents of the landfills regarding hazardous substances and the sites are mostly dominated by municipal solid waste disposal. In Annex II further information on these priority sites is presented. A detailed characterisation of the risks caused by the landfills to the Baltic Sea is not possible with the present information on analytical environmental data and landfill content. Therefore, the risk characterisation is largely based on consultation with the local authorities. The St Petersburg city authorities have access to the existing monitoring information on which their analyses are based, where available.

In addition to the landfills and dumps presented in the map (Figure 9), some other activities producing significant amounts of hazardous waste were identified as priorities for measures to reduce the load of hazardous substances. The following activities were identified as potential hazardous waste sources in St Petersburg:

#### *General hazardous waste collection*

Private citizens and households are not



**Figure 10:**  
Primorskaya closed landfill  
5.11.2009.  
(Photo: © Risto Valo)



**Figure 11:**  
Volkhonka landfill 5.11.2009.  
(Photo: © Risto Valo)

provided with hazardous waste management services in St Petersburg. Hazardous waste from households, such as waste oils, WEEE, mercury-containing articles and batteries, is not separately collected from MSW and are consequently disposed of as regular solid waste in landfills.

The situation should be improved, especially as to potential MSW incineration in the future. Especially the closure of Novoselki landfill will put pressure on changes in waste management.

#### *Galvanic waste treatment*

Galvanic waste treatment has been identified as a problem in St Petersburg. Currently waste from metal working facilities containing high amounts of heavy metals is being disposed of in Krasny Bor. It is not treated in any way.

### **3.1.11 Conclusions**

The main hazardous waste concerns for the Baltic Sea are related to old burial sites, shortcomings in hazardous waste management and possible illegal dumpsites:

- Incomplete information on hazardous waste generation.
- Hazardous waste from households is not collected separately, and it is contaminating municipal solid waste.
- Insufficient control and capacity to treat various hazardous wastes from industry and households, including waste oils, solvents, accumulators, etc.
- Due to the lack of capacity and to expenses, the industry stores hazardous waste in their premises on a temporary basis, which may cause risks to human health and to the environment preventing environmentally sound management.
- Final disposal of mercury created in waste disposal operations (fluorescent lamp recycling).
- Hospital waste management and illegal burial sites need further investigations.
- Galvanic waste treatment has been identified as a problem in St Petersburg. Currently waste from metal working facilities containing high amounts of heavy metals is being disposed of in Krasny Bor. It is not treated in any way.
- The long-term operation of the Krasny Bor polygon poses risks due to the high amount of unknown hazardous wastes and its future wastewater treatment facility

operation will be crucial for the Baltic Sea. There are shortcomings in Krasny Bor monitoring practices in terms of pollutant control.

- Current monitoring practices are not sufficient to provide reliable information on the impacts of landfills on water bodies, especially with regard to hazardous substances.

## **3.2 Leningrad Oblast**

Leningrad Oblast is large in area (27,560 km<sup>2</sup>) but relative small in population (1.27 million) compared to St Petersburg. The main industries are fuel, oil refining, forestry, pulp and paper, chemical production and engineering. There are several rivers discharging directly into the Gulf of Finland. Part of the oblast territory is catchment area of Lake Ladoga, which although being connected to the Gulf of Finland via the Neva River also can be considered to retain transport of substances to the Baltic Sea.

### **3.2.1 Hazardous waste generation**

Hazardous waste generation is not accounted for in Leningrad Oblast. The generation of municipal solid waste, however, has been subject to state accounting since 1994. The estimates on the quantities of MSW produced vary depending on the source and method of estimation. According to the oblast administration, 400 different types of waste are being produced in LO, totalling 4.3 million tonnes (Committee on Natural Resources and Environmental Protection 2006). In 2007, 16,813 enterprises producing waste in the region were under the supervision of Rospotrebnadzor Administration for the Leningrad Region. In 2007, 3,778,287 tons of waste were generated in the Leningrad Region including 1,376,817 tonnes of industrial waste; 805,284 tonnes of household waste, 3.5 tons of pesticides and agricultural chemicals, 213,822 tonnes of sewage sludge, 826,269 tonnes of poultry and livestock waste and 556,090 tonnes of other waste.

In addition to the annual generation, 25 million tonnes of waste are estimated to have been accumulated and stored by industries in LO (ibid.).

### **3.2.2 Hazardous waste from households**

The Russian legislation contains no specific regulations for municipalities concerning separate collection, transportation, disposal or treatment of hazardous waste generated by house-

holds. Therefore it is not separated from MSW. Like St Petersburg, also Leningrad Oblast faces challenges in funding the organisation of municipal solid waste collection, not to mention separate hazardous waste collection.

Based on information available from Finland on hazardous waste of household origin, it could be estimated that households produce 3-5 kg/year/person of hazardous waste. For Leningrad Oblast this means approximately 4,000-5,000 tonnes of hazardous waste landfilled annually.

### 3.2.3 Hazardous waste management in the region

In Leningrad Oblast hazardous waste was buried in non-agricultural lands until 1992. All hazardous waste from the oblast is now sent to Krasny Bor. The oblast authorities reportedly know the locations of the old burial sites. In addition, the authorities maintain a register of waste sites, which contains the composition and volume of waste in 365 legal and illegal landfills. According to the authorities, good data are available; however, they were not made available to the consultant for identification of the priority landfills. In addition, it is not possible to identify the landfills containing hazardous waste of classes I-III.

Fluorescent lamps and mercury-containing thermometers are treated as mercury-containing waste. However, the collection of lamps is at present the responsibility of the municipalities, and according to the oblast authorities waste may be accumulating in cellars.

WEEE is not considered as hazardous waste and is landfilled as MSW along with batteries and paints from households.

Obsolete pesticides have been inventoried and disposed of in Krasny Bor.

A PCB inventory was made in the oblast ten years ago, including a list of probable storages of PCBs. According to the authorities, currently there are no PCBs in electrical installations and PCB oils have already been disposed of in Krasny Bor.

There is a number of companies in Leningrad Oblast providing hazardous waste collection, storage and to some extent treatment. These are believed to be well known, as their activity requires a federal license, including a passport for each type of waste managed, and trained personnel. Unauthorised storages

have, however, been found as well. According to the authorities, as much as 11 plants treat Hg-containing fluorescent lamps collected from schools, hospitals and enterprises. There is also a high number of companies having recently started waste oil collection and recycling. However, according to the authorities there are problems with these enterprises since sometimes regeneration means only repacking.

### 3.2.4 Municipal solid waste (MSW)

Currently there are 12 authorised MSW landfills operational in LO (Committee on Natural Resources and Environmental Protection 2007b), and 200 permanently operating unauthorised sites (Committee on Natural Resources and Environmental Protection 2007a). In 2008, the Russian Geo-Ecological Centre collected data on 289 legal and illegal landfills and dumps in the oblast area to estimate the collection of potential greenhouse gases.

Illegal landfills are a problem in the oblast. According to the authorities, it is not possible to estimate their number. However, the estimate presented in Peterburgskii Sotsialnii Portal<sup>4</sup> by the vice-governor of LO exceeded 2,000.

<sup>4</sup> [www.socspb.ru](http://www.socspb.ru)

### 3.2.5 Medical waste

Leningrad Oblast generates 19,000 tonnes of medical waste of different categories annually. For the most part (17,000 t) it is treated as MSW (though sometimes after sterilisation). The remaining 2,000 tonnes should be thermally destroyed, which is not the current practice. Currently only two hospitals have hospital waste incinerators (Tosna and Leningrad Oblast clinical hospital). According to the authorities, 16 additional incinerators would be needed to ensure sound management of medical waste.

According to Rostekhnadzor, there are no specific facilities in NW Russia licensed for disposal of healthcare waste. It is known, however, that at least some plastics are disposed of by some specialised enterprise. Mostly Class B medical waste is, however, disposed of in MSW landfills after disinfection.

The risk of medical waste to the Baltic Sea depends largely on management options. Air emissions could hardly be a risk to the Baltic Sea. However, even with high-quality incineration inappropriate slag management may represent a risk.



### 3.2.6 Illegal waste disposal

In 2005, the administration mapped 110 illegal dumping sites, which contained altogether almost 30,000 m<sup>3</sup> of waste (Monitoring Results of the Negative Impact on Environment from Illegal Dumping Sites and Landfills on the Territory of the Leningrad Region in 2005. Summary of Urangolograzvedka results). 14 priority sites were further studied and subjected to radio-ecological, environmental-chemical and epidemiological studies. More than 70% of the samples exceeded maximum permissible values for benzo-a-pyrene and PCBs, suggesting industrial contaminant sources. Further investigations on contamination of illegal dumping sites would be necessary.

A survey of six typical unauthorised hazardous waste disposal sites in LO has been carried out (Delarov, 2009).

**Landfill mass.** Within landfill territory, pollution by heavy metals of class I - III was high, landfill mass containing typically heavy metals lead, cadmium, zinc and copper at concentrations exceeding the MPC, at the maximum even hundredfold as at Landfill 224 (Vozhnesenie) where visible inspection of the site revealed metal industry wastes. Average concentration of zinc was 5100 mg/kg, of copper 1650 mg/kg and of cadmium 9 mg/kg. Among the organic

compounds monitored, DDT exceeded the MPC level at two landfills, tenfold at the Pesky landfill (88) (Figure 12).

**Groundwater.** Monitoring of the Pesky landfill from wells upstream and downstream from the landfill showed that the landfill impacts groundwater quality. Concentrations of mercury, lead, chromium, nickel, vanadium and zinc in downstream groundwater exceeded the drinking water (SanPin 2.1.5.1315-03) standard and were higher than in upstream groundwater.

**Surface water** outside landfills contained concentrations exceeding the State Sanitary Rules and Norms (2.1.5.980-00) for the following parameters: petrochemicals, antimony, beryllium and at all sites BOD5 and COD were highly exceeded.

Two of the six prioritised illegal landfills (Landfills 88 and 224) contained elevated levels (120 to 1060 µg/kg) of DDT (Monitoring results... 2005). Based on the sampling and analytical data available, it is, however, impossible to judge whether the contamination is due to landfilling hazardous substances or e.g. contaminated soils from a nearby horticultural community. The concentrations are quite low but higher than the Russian maximum permissible concentration (100 µg/kg).

In 2008, the Russian Geo-Ecological Centre also identified illegal dumps as a threat to the environment and proposed a number of actions against illegal dumping.

### 3.2.7 Landfill monitoring

Landfills are monitored by the Federal Service for Hydrometeorology and Environmental Monitoring under the Ministry of Natural Resources and Ecology. It was not possible to get the monitoring results for the risk assessment of the landfills. According to Rosprirodnadzor, the monitoring network is not extensive and data are scattered.

The Committee of the Leningrad Region for Natural Resource and Environmental Protection carried out a survey on 289 MSW dumps and landfills in LO in 2006 and classified the landfills based on their gas generation potential (volume of waste, composition of waste and age of waste) (Russian Geo-Ecological Centre 2008). Ten landfills were chosen for assessment of gas emissions and groundwater pollution and analysed for e.g. oils, phenols and heavy metals. Groundwater samples were

**Figure 12:**  
Remediated Landfill 88 near Pesky horticultural village. No significant disposal activity was observed except outside the landfill.



taken from 2.5–3.0 m deep wells. The conclusions suggest pollution of groundwater from the dumps, especially with regard to Hg and some other metals. Slight oil contamination was found

in most of the sites. COD and BOD5 clearly exceeded the San Pin 2.1.5.1059-01 norm at nearly all groundwater monitoring points. High COD indicate anoxic and low redox conditions with increased risk of heavy metal leaching. Volatile organic compounds were commonly found in air samples. It is to be noted, however, that the objective of the survey was to identify landfills for greenhouse gas collection in the context of Joint Implementation projects and not to identify high risk sites for groundwater or the Baltic Sea.

Regarding monitoring of unauthorised dump sites, the Committee of Natural Resources orders dump site investigations and the local Rospotrebnadzor executes the investigations, together with self-government bodies. The following field and analytical monitoring procedures are followed in surveys of unauthorised sites of hazardous waste disposal in Leningrad Oblast (Delarov 2009):

- Visual inspection; incl. topography, waste data, hydrology, land use, etc., which is the basis for the ecological passport;
- Radiology investigations;
- Surface soil (0–0.1 m) sampling within and outside the landfill territory;
- Analysis of soil includes heavy metals and organic compounds (PCB, PAH, oils and VOCs);
- Surface water around the landfill and case-by-case also groundwater 10–30 m upstream and downstream from the landfill;
- Analysis of water includes: heavy metals, oils, COD, BOD, surface-active substances and phenols;
- Sampling of atmospheric air and analysis thereof: aromatic and halogenated hydrocarbons, heavy metals, solid particles, CO<sub>2</sub>, NO<sub>2</sub> and SO<sub>2</sub>;
- Indicator microbes and helminths in soil of landfill and surface water near the landfill.

The results of the conducted surveys of landfills have indicated the following:

- About 4% of the dumps contained industrial waste;
- Soil of landfills was heavily polluted by heavy metals, contamination index, Zc

indicate tens to hundred time higher concentrations compared to background levels of each heavy metal;

- Benzo(a)pyrene and PCBs exceeded the standard value on 30% of the sites;
- Surface soil around the landfills is not contaminated;
- Surface water around landfills: BOD<sub>5</sub>, COD, colorcolor, oil products are typically high, sometimes also anionic surfactants;
- Groundwater quality is impaired by solids, colorcolor, COD, BOD, nitrates, nitrites and ammonium;
- Atmospheric air of landfills contain low amounts of several organic compounds related to landfill combustion.

### 3.2.8 Priority hazardous waste sites

The most important landfills and hazardous waste sites were selected based on the proposal of the Leningrad Oblast administration and the limited information available on the contents and locations of the landfills and other sites where hazardous waste has been managed. In addition to landfills and dumps, some other activities producing significant amounts of hazardous waste were identified as priority areas for measures to reduce hazardous substances load.

As Leningrad Oblast is a fairly large area, some efforts were made to analyse pollutant transport to the Gulf of Finland by zoning the region into separate drainage basins. The initial list of landfills proposed by the Leningrad administration was then further adjusted by taking into account that pollutants from certain districts will enter Lake Ladoga rather than the Gulf of Finland (as for instance Volkhov) and accumulate in the sediment.

The following drainage basins were identified (Figure 13):

1. The water basins of the Luga, Neva, Narva and Plussa Rivers are minor water flows emptying into the Gulf of Finland. The probability of the inflow of pollutants in the Baltic Sea basin is high (red zone).
2. The water basin of Lake Ladoga and minor water flows emptying into it in the west. The probability of inflow of pollutants into the Baltic Sea basin is average (yellow zone).
3. The water basin of lakes Ilmen and Onega, the Volkhov, Syas and Svir Rivers. The probability of inflow of pollutants into the Baltic Sea basin is low (green zone).

**Figure 13:**  
Zoning of Leningrad Oblast by the likelihood of waterborne contaminants from hazardous waste sites to enter the Gulf of Finland.



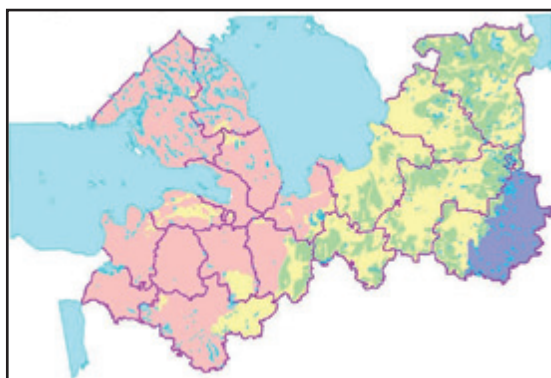
4. The water basin of the Volga River. The probability of inflow of pollutants into the Baltic Sea basin is zero (blue zone).

The catchment area analysis was combined with information from the Russian Regional Environmental Centre, which has zoned Leningrad Oblast by its natural conditions (slope, flooding, groundwater depth and presence of impervious silts) and suitability to locate industrial and household waste disposal sites. As a result the waste disposal sites were marked as favourable, relatively favourable or unfavourable (Figure 14). These results were also used to identify the most important waste sites.

The sites marked with pink in Figure 14 should be considered as the most critical in terms of contaminant transport to the Gulf of Finland.

The selected priority hazardous waste sites of Leningrad Oblast are mostly the active MSW landfills shown in Figure 15. Only one of the priority landfills is purely industrial. All landfills prioritised by Leningrad Oblast authorities were MSW landfills. The majority of them are small and managed, but none of them has collection of leachate, and their hazardous waste content is unknown. In the landfills of Ivangorod, Sosnovyi Bor and Gatchina, industrial waste has been landfilled and they are located close to the Baltic Sea or to a river connected with the sea.

**Figure 14:**  
Zoning of Leningrad Oblast by natural factors.



Detailed information on these sites is presented in Annex II.

In addition to the above-mentioned landfills and dumps, other activities identified as potential hazardous waste sources in Leningrad Oblast include the following:

#### *Kirpichniy Zavod*

Kirpichniy Zavod is an old industrial facility area where some 900,000 mercury-containing fluorescent lamps are stored. Due to the past mercury lamp management activities there is a high possibility of soil or construction contamination.

#### *General fluorescent lamp disposal*

As in St Petersburg, fluorescent lamps and mercury-containing thermometers are treated as mercury-containing waste.

However, the collection of lamps is at present the responsibility of the municipalities, and according to the oblast authorities waste may be accumulating in cellars. Hence public buildings, such as schools and hospitals, have accumulated a high amount of mercury-containing waste.

#### *General hazardous waste collection*

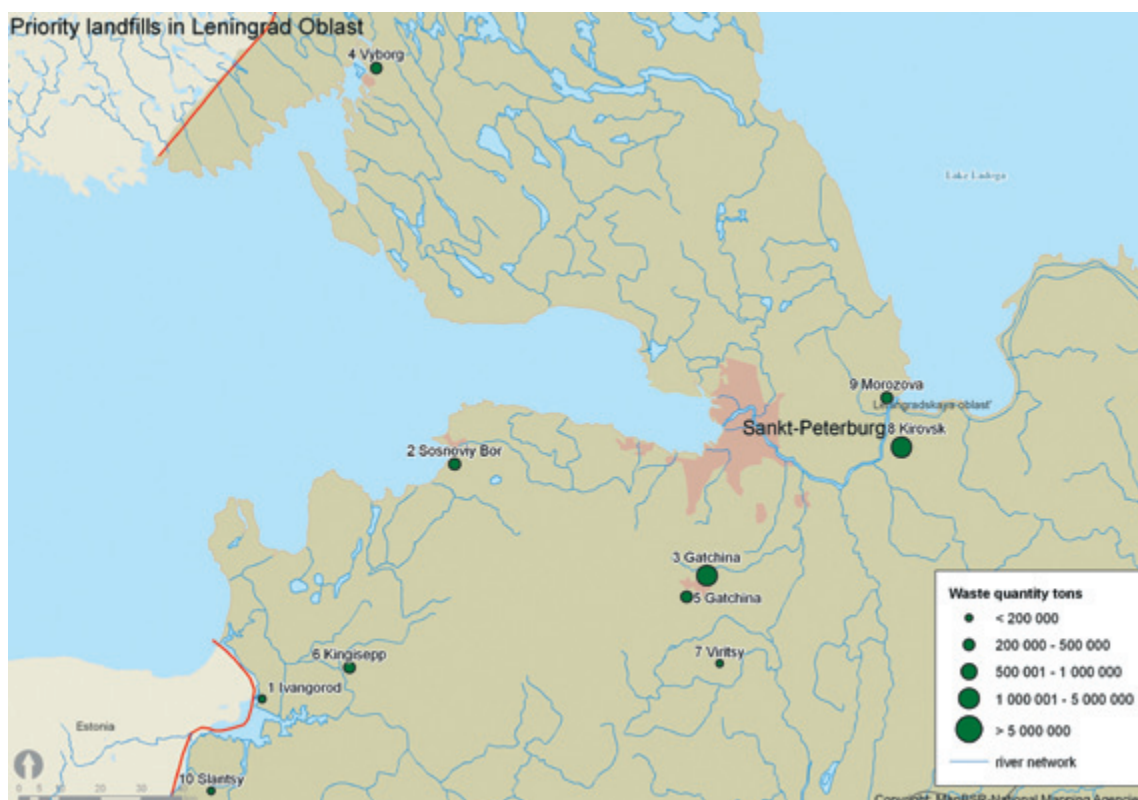
Private citizens and households are not provided with hazardous waste management services in LO. Hazardous waste from households, such as waste oils, WEEE, mercury-containing articles and batteries, are not collected separately from MSW and are consequently disposed of as regular solid waste in landfills. The situation should be improved, especially when it comes to potential MSW incineration in the future.

### **3.2.9 Conclusions**

Due to the lack of landfill and illegal dumpsite data a complete picture of hazardous waste threats from LO to the Baltic Sea may not become available. As in St Petersburg, the main concerns are related to old burial sites, operational illegal dumpsites and shortcomings in present hazardous waste management:

- There is no information on hazardous waste types and quantities generated in the region.
- Burial of hazardous waste was common practice until 1992. According to the local authorities, the old burial sites have





**Figure 15:**  
The most important waste sites of Leningrad Oblast.

been remediated, but it is not known whether there is transport of hazardous substances from the sites.

- Illegal landfilling is a problem in the oblast.
- Municipalities may have difficulties in fulfilling their responsibilities concerning collection of MCW from public entities.
- The possible leachates from the Krasny Bor polygon containing 1.7 million m<sup>3</sup> of industrial hazardous waste in the LO region cannot be completely ruled out.
- Hazardous waste from households is not collected separately and is contaminating municipal solid waste.
- There is not sufficient control or capacity to treat various hazardous wastes from industry and households, including waste oils, solvents, WEEE, etc.
- Hospital waste management capacity is too low and requires additional investments, despite the fact that it may not be of concern to the Baltic Sea.
- Current monitoring practices are not sufficient to provide reliable information on impacts of landfills on waterbodies, especially with regard to hazardous substances.

### 3.3 Kaliningrad Oblast

Kaliningrad Oblast is the westernmost part of Russia, separated from the rest of the country. Kaliningrad Oblast has borders with Lithuania

and Poland. The area is about 15,000 km<sup>2</sup> and the population amounts to approximately one million.

The main industries are machine construction, pulp and paper, food and fish, and light industry. Kaliningrad is famous for its amber, having 90% of the world's amber resources. Oil, brown coal and peat are the other main natural resources. The landscape is plain and characterised by several rivers that flow into the Baltic Sea. The Pregolja River is the main river whose catchment basin covers most of the oblast area.

#### 3.3.1 Hazardous waste generation

Official data on hazardous waste generation from industry and other organisations was obtained from the authorities of Kaliningrad. According to the information of the 2-TP (waste) form in 2008, totally 631,154 tonnes of waste were generated as follows:

Class I wastes	137 t
Class II wastes	100 t
Class III wastes	10,334 t
Class IV wastes	95,966 t
Class V wastes	524,617 t

The Kaliningrad authorities also provided a list of detailed composition and amounts of hazardous waste of classes I to III. Totally 102 waste types are included in this statistics. A

summary of the list is presented in Annex IV. The proportion of hazardous waste classes I to III was about 2% of total wastes produced.

The annual waste disposal at landfills is about 900,000 tonnes.

### 3.3.2 Hazardous waste from households

The Russian legislation contains no specific regulations for municipalities concerning separate collection, transportation, disposal or treatment of hazardous waste generated by households. As in St Petersburg and Leningrad Oblast, hazardous waste from households is disposed at MSW landfills in KO.

### 3.3.3 Hazardous waste management in the region

In Kaliningrad Oblast there are no special landfills for hazardous waste or industrial waste of hazard classes I to II. Therefore hazardous wastes from industrial companies are stored temporarily at the sites of industrial companies or at temporary storages for hazardous wastes (classes I and II). There is limited treatment capacity for hazardous waste in KO. No reliable information on the amounts of hazardous waste at MSW landfills is available. However, extrapolating from the Finnish annual figure (3-5 kg hazardous waste per person), the amount of hazardous waste landfilled is estimated to between 3,000-5,000 tonnes a year.

Industrial hazardous wastes are treated by commercial companies. The treated wastes are disposed in an industrial waste landfill (such as Kruglovo) operated by OUP, United Waste Handling System (Administration of Kaliningrad, Occow and ECAT Kaliningrad). In KO there is capacity to collect separately the following wastes from industry, followed by recycling or deactivation:

- scrap metal;
- mercury-containing waste, started in 1994;
- motor industry waste; rubber, accumulators, used oil (since 2003) by GorEcoTrans, spent oil since 2005 by several companies;
- oil-contaminated rags, oil emulsions;
- wood processing waste;
- bitumen, polystyrene;
- medical waste; bandages, needles, biological waste (since 2006), incinerator in one hospital (Takis 2004).

Several companies have licence to collect, treat, transport and dispose hazardous waste in Kaliningrad Oblast. Some of the companies have a more limited license to operate in the field. A summary of the present situation (Kaliningrad 2009) of these companies and their activities for hazard classes I-III is as follows:

Waste	HC	Companies
Instruments and waste containing mercury	I	1
Used accumulators and batteries	II	3
Waste containing oil	III	11
Mud from oil containers and storage tanks	III	7
Filters for cars and wiping material cont. oil	III	2

There is not enough treatment capacity for hazardous wastes of classes I and II in Kaliningrad, only 0-3% of the generated and collected wastes are treated or decontaminated. Hazardous wastes of classes I and II are collected separately from industry and municipalities, but not from households. There is one temporary storage for hazardous wastes (classes I and II) in Kaliningrad Oblast, but no such storages in industrial facilities. Hazardous wastes of class III are mainly oil-containing wastes, sludges, emulsions and other materials (Annex IV). About 80% of the industrial hazardous wastes of class III are treated/used. Legally hazardous wastes can be, and are, stored on the industrial premises for three years before treatment if no centralised treatment/deactivation capacity is available.

As in Leningrad Oblast and St Petersburg mercury lamps are collected from industry and public institutions but not from households. About 145,000 luminescent lamps (30 tonnes) were collected in 2008. One company, Syntez LLC has licence to collect and demercurise mercury lamps in KO (Figure 16). The capacity of the facility is 250,000 mercury lamps annually. Long-term storage of mercury lamps is not common practice at the facility.

Today there are 800 tonnes of mercury waste in a temporary indoor storage in KO. This quantity of mercury seems very high compared to the normal recovery rate of pure mercury sulphide from fluorescent lamp recycling.

Companies regenerating oil and separating oil from liquid wastes operate in the Kaliningrad port area. Shipyards generate approximately seven tonnes of hazardous waste in ship painting and scrapping per ship that would need treatment. Organic solvents are not treated or recovered.



There are four enterprises that collect and recycle recyclable wastes (Administration of Kaliningrad, Occow and ECAT Kaliningrad). CColored metals are recycled. Batteries and accumulators are collected separately to some extent by a company that store the wastes waiting for treatment (Figure 17).

### 3.3.4 Municipal solid waste (MSW)

In 2003, the amount of disposed wastes at the oblast landfills was estimated to about 35 million m<sup>3</sup>/28 million tonnes (Tacis, 2002-2004). A waste database for KO is under preparation in co-operation with ECAT Kaliningrad.

Currently there are 39 legal MSW landfills operating in Kaliningrad Oblast (Minister of Utilities and Construction, Kaliningrad Region, 2009). These landfills receive hazardous wastes of classes IV and V and some of class III. Each city and parish has its own landfill. The plan in waste management is to build alternative MSW treatment capacity and intensify separate collection of waste. This should lower the need of landfill capacity in the future. The Tacis project (2004) concluded that two new sanitary landfills would replace all present landfills in KO and would be constructed according to present Russian/EU standards.

The oblast-wide landfill inventory of the Tacis project (2002-2004) identified 161 landfills and dumpsites and presented their locations on maps. Most of these sites were in operation in 2003. Total area of these landfills is 134 hectares. Six of these were in the highest, category 6<sup>5</sup> sites containing over one million cubic meters of waste (1 to 22 million m<sup>3</sup>).

Some of these might be also high-risk landfills because of their location near the Baltic Sea and the quantity of hazardous wastes from households which was co-disposed to landfills mixed with MSW. Hazardous wastes from industry are typically disposed in pits excavated in MSW fill. It was estimated that 75% of the industrial wastes are disposed in landfills without any pretreatment (Tacis, 2003).

Kaliningrad city's landfill, Kosmodemyanskoe, is by far the biggest with 22 million cubic meters of waste. All category 1 landfills<sup>6</sup> and most of category 2<sup>7</sup> sites are illegal dumpsites in rural areas. One major problem of the landfills are air emissions (carbon monoxide, organic acids, sulphur dioxide and methane) and littering because landfill gas is not collected and waste is not covered. Leachate is not collected and



**Figures 16a & 16b:**  
Waste fractions (glass, metal and ceramic parts) from mercury lamp demercurisation process, Syntez Ltd., waiting for transportation to landfill.  
(Photo credit: Risto Valo, Pöyry)



**Figure 17a & 17b:**  
Used accumulators and capacitors waiting for treatment at Syntez Ltd.  
(Photo credit: Risto Valo, Pöyry)



treated effectively at any of the landfills. A few landfills have sedimentation ponds for leachate but because leachate collection is inefficient, only part of the water filtrating out of the waste fill is treated. 78 of the 161 landfills were regis-

<sup>5</sup> Categorization of landfills is done based on the quantity of waste on the landfill

<sup>6</sup> Class 1: less than 100 m<sup>3</sup>

<sup>7</sup> Class 2: 100 - 1000 m<sup>3</sup>

tered at the Sanitary-Epidemiological Centre in KO. This means that all except class 1 sites were registered. Hazardous wastes at the landfills were not inventoried in the Tacis project. The amounts of waste and categories of KO landfills are as follows:

Category 1	Less than 100 m <sup>3</sup>	75 sites
Category 2	100-1,000 m <sup>3</sup>	40 sites
Category 3	1,000-10,000 m <sup>3</sup>	24 sites
Category 4	10,000-50,000 m <sup>3</sup>	5 sites
Category 5	50,000-1,000,000 m <sup>3</sup>	11 sites
Category 6	More than 1,000,000 m <sup>3</sup>	6 sites

According to the Tacis project, the environmental impacts of the 161 landfills could not be assessed due to the lack of monitoring results. Littering was identified on sites as the main problem. Other impacts were the effects of leachate on surface and groundwaters and lack of methane collection and treatment. The Tacis project proposed an audit of the landfills in order to assess the impacts, starting at category 6 and 5 sites (totally 17 landfills) and their ground- and surface water impacts. The audit would provide the necessary data needed for a risk-based evaluation of environmental risks at those landfills. A dumpsite rehabilitation programme was introduced in the Tacis final report.

In KO collection and transport of MSW is the responsibility of municipalities. Hazardous waste from households is transported and disposed of together with MSW. All of the MSW landfills are operated (since the beginning of 2009) by a municipal Regional Waste Management Company "Chistota". Solid waste is also collected and transported by seven private companies (Administration of Kaliningrad, Occow and ECAT Kaliningrad).

The ability of one company to manage the MSW of Kaliningrad Oblast has been called in question as mentioned by Mrs Alla Ivanova (Deputy Head, Government of Kaliningrad Region International Department). In 2003, the collection rate of MSW in urban areas (Tacis, 2003) was about 90%, but in rural areas as low as 5%. However, these figures were estimated to increase by 2010 to 100% for urban and 75% for rural areas. Industrial facilities transport their wastes mainly themselves to landfills.

The main problems of waste management in Kaliningrad (Primak and Kondratenko, 2007) were:

- complete changes in Russian environmental legislation;
- changes in state solid waste management system;

- lack of polygons and waste sorting stations;
- incorrect accounting of waste, the landfills have no weighing machines;
- incorrect official statistics for industrial waste.

### 3.3.5 Medical waste

In Kaliningrad Central Hospital there is an incinerator for medical waste treatment. Other hospital waste and obsolete medicines are disposed of at landfills. In 2005, 3,880 tonnes of medical waste were generated in KO (Administration of Kaliningrad, Occow and Ecat Kaliningrad). The treatment unit at Kaliningrad Central Hospital is the only incinerator in KO and it has a capacity of 20 kg/h, which is enough for only one hospital.

### 3.3.6 Illegal waste disposal

There were 39 legal operating landfills in the Kaliningrad Region in 2009. The Tacis project estimated the total amount of landfills and waste disposal sites (open and closed) at 161 (in 2003), occupying an area of 134 hectares. The number of illegal landfills was not available.#

Illegal and closed landfills are not monitored or controlled (Ivanov *pers. Comm* 2009) and therefore their environmental impacts are unknown.

### 3.3.7 Landfill monitoring

Chistota monitors the landfills that they operate. Rostekhnadzor is the Federal organisation responsible for industrial waste monitoring and Hydromet is their sampling and analysis organisation of site monitoring. Licensed landfills have their own monitoring results. Monitoring of air and water at landfills is conducted by Rospotrebnadzor, the Federal Sanitary and Epidemiological Supervision organisation, which has the results.

Only limited information on hazardous waste leaching from MSW landfills is available because these compounds are usually not included in the monitoring list of operating landfills. Mr Alexandr Ivanov, Head of the Directorate for Marine Environment Protection, informed that water quality of the coast to 500 m off shore and the Vistula Bay is monitored by a laboratory ship that analyses oil and 20 other parameters in the water. The aim is to monitor releases of oil and other hazardous waste flow from land (industrial wastewater, rivers,

Component	TLV <sup>1</sup> mg/l	EQS (EU) mg/l <sup>2</sup>	Kruglovo mg/l	Kosmodemiansky mg/l	Sovetsk mg/l	Chernyahovsk mg/l	Gusev mg/l
pH			6.60	6.85	6.85	7.25	6.8
Phenol	0.001		0.0046	0.049	0.0009	0.0028	0.028
Oil hydrocarbons	0.3		0.18	0.26	0.14	0.23	0.40
Chlorophenols			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	0.001	0.00008-0.00025	0.0001	< 0.0001	0.0001	< 0.0001	< 0.0001
Chromium total	0.05		0.003	0.001	0.0005	0.0018	0.002
Mercury	0.0005	0.00005	< 0.05 x 10 <sup>-3</sup>	< 0.05 x 10 <sup>-3</sup>	0.089 x 10 <sup>-3</sup>	< 0.05 x 10 <sup>-3</sup>	< 0.05 x 10 <sup>-3</sup>
Arsenic	0.01		0.0016	0.0004	< 0.005	< 0.005	< 0.005
Cobalt	0.1		0.0029	< 0.001	< 0.001	0.0014	0.001
Copper	1.0		0.0065	0.0012	0.0017	0.0073	0.0007
Nickel	0.02	0.02	0.0066	0.0032	0.021	0.0062	0.0037
Lead	0.01	0.007	< 0.001	< 0.001	< 0.0002	< 0.0002	< 0.0002
Zinc	1		0.03	0.015	0.021	0.028	0.049
PAH compounds sum of 16 compounds µg/l			0.6	0.5	0.5	0.4	1.7
Total cyanides	0.07		< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
DCM (dichloromethane)	0.02	0.02	0.5 x 10 <sup>-3</sup>	0.50 x 10 <sup>-3</sup>	0.078 x 10 <sup>-3</sup>	0.012 x 10 <sup>-3</sup>	0.013 x 10 <sup>-3</sup>
Chloroform	0.06	0.0025	0.00172	0.00217	0.00143	0.00031	0.00068
Carbon tetrachloride		0.012	0.089 x 10 <sup>-3</sup>	0.036 x 10 <sup>-3</sup>	0.019 x 10 <sup>-3</sup>	0.020 x 10 <sup>-3</sup>	0.013 x 10 <sup>-3</sup>
Benzene	0.001	0.01	7.2 x 10 <sup>-6</sup>	50 x 10 <sup>-6</sup>	31 x 10 <sup>-6</sup>	6 x 10 <sup>-6</sup>	4 x 10 <sup>-6</sup>
Toluene	0.024		0.00028	0.00127	0.00025	0.000068	0.00742
PBDE compounds. sum. pg/l				440			
PCB compounds. sum. ng/l			3.1	6.3	1.9	0.6	3.7
Dioxins. sum. pg/l			67	55	263		

<sup>1</sup> The Threshold Limit Value (TLV) of contaminants were determined according to Hygienic Norms GN 2.1.5.1315-03 "Threshold Limit Values (TLV) of chemical substances contained in water of water bodies for drinking and household water use" and Hygienic Norms GN 2.1.5.2280-07 "Threshold Limit Values (TLV) of chemical substances contained in water of water bodies for drinking and household water use". **Supplements and amendments ?1 to GN 2.1.5.1315-03".**

<sup>2</sup> EQS = Annual Average Environment Quality Standard in the EU for inland surface waters (<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0084:0097:EN:PDF>)

leachate from nearby landfills) and harbours by the Baltic Sea.

The BALTHAZAR project monitored landfill leachate and sediment around five landfills in KO in November 2009. A summary of the results is presented in Tables 3 and 4 and sampling locations in Appendix VIII.

Heavy metal concentrations were somewhat elevated at the sampling points but did not exceed the threshold limit values (MAC), except for nickel outside the Sovetsk landfill. Organic contaminants, PBDEs, PCBs, PCDD/Fs and PAHs, were found at all landfills. Concentrations of PAH compounds were at 0.4 to 1.7 µg/l, i.e. are higher than those in the Leningrad Oblast monitoring. PBDE level 440 pg/l at the Kosmodemiansky landfill is also higher than that found in the Leningrad Oblast monitoring. The presence of dioxins were 55 to 260 pg/l, i.e. also higher than the concentrations at the Leningrad Oblast landfills.

In sediments outside the landfills several organic contaminants (PBDEs, PCDD/Fs, PCBs and PAHs) were found. The concentra-

tion of PBDEs, 95 ng/kg, was at the same level as the Gatchina River sediment (60 ng/kg) in Leningrad Oblast. Dioxins were high outside the Sovetsk landfill (940 ng/kg). This indicates contaminated sediment if compared to Finnish sediment level 2 value of 500 ng/kg. PCDD/F at 120 to 250 ng/kg were present also in the other sediments. PCB concentration 68 µg/kg outside the Sovetsk landfill is much higher than in other samples and in the Gatchina landfill sediment in Leningrad Oblast. Several PAH compounds, especially anthracene, benzo(a)anthracene and benzo(a)pyrene, were elevated in the sediment. In the sediment outside the Chernyahovsk landfill the PAHs were at the highest level of the investigated landfills.

The Prigolya River water was monitored for oil upstream and downstream from the Oil Trans-Shipping Terminal. The upstream result was 0.027 mg/l and downstream 0.022 mg/l. Samples were taken in the middle of the river, far from the sewage effluent point and the shore area that has visible oil leaks into the river. This could explain the non-existent effect of the terminal on the water quality of the river in this monitoring.

**Table 3:**  
Summary table  
Kaliningrad Oblast landfill  
leachate screening results  
in November 2009.



**Table 4:**  
Results of  
Kaliningrad Oblast  
sediment screening  
around landfills.

Component	TLV <sup>1</sup> (AAC), mg/kg	FIN Sediment quality criteria <sup>2</sup>	Kruglovo mg/kg	Kosmodemiansky mg/kg	Sovetsk mg/kg	Chernyahovsk mg/kg	Gusev mg/kg
pH			6.99	6.49	6.82	6.71	6.47
Phenol			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Oil products		50/1500	28.8	191.0	31.2	346.0	10.9
Mercury	2.1	0.1 / 1	0.12	0.09	0.48	0.25	0.08
Zinc	(220)	170/500	64	71	50	2.5	44
Copper	(132)	50/90	13	21	13	0.9	12
Nickel	(80)	45/60	1.0	6.6	14	1.0	16
Lead	32.0 (130)	40/200	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Cadmium	(2.0)	0.5 / 2.5	0.8	2.0	0.1	< 0.05	1.8
Chromium		65/270	18	36	9.0	1.3	29
Cobalt			2.0	5.3	1.0	0.8	5.7
Arsenic	2.0 (10)	15/60	7.1	14.2	4.2	0.2	11.8
Benzene	0.3		0.0016	0.0017	0.0075	0.0024	0.0040
Toluene	0.3		0.0023	0.025	0.0033	0.069	0.066
Ethylbenzene			0.0001	< 0.0001	0.050	0.0008	0.0004
m-Xylene and p-Xylene	0.3		0.0002	0.0064	0.0033	0.0024	0.0019
o-Xylene	0.3		0.0004	0.0034	0.011	0.0015	0.0016
Chlorophenols			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PBDE:s, ng/kg				95			
Endosulphan (sum of isomers)				< 0.02 x 10 <sup>-3</sup>			
PCDD/F, ng/kg		20/500	250	120	940		
PCB, sum of 12, µg/kg			0.6	0.4	68	10	0.4
PAH- compounds, mg/kg							
Anthracene		0.01 / 0.1	0.0015	0.1279	0.2230	2.1166	0.0204
Acenafene			< 0.001	0.0087	0.0186	0.0541	0.0047
Acenaphthylene			< 0.001	0.0034	0.0122	0.4392	0.0036
Benzo(a)anthracene		0.03 / 0.4	0.0033	0.2173	0.3001	1.0028	0.0143
Benzo(a)pyrene	0.02	0.3 / 3	0.0038	0.2018	0.2602	1.0958	0.0099
Benzo(b)fluoranthene			0.0079	0.2251	0.2848	1.2325	0.0178
Benzo(k)fluoranthene		0.2 / 2	0.0022	0.1608	0.1147	0.5152	0.0084
Benzo(ghi)perylene		0.8 / 8	0.0063	0.2210	0.2554	1.3518	0.0177
Dibenzo /ah/ anthracene			< 0.001	0.0471	0.0549	0.2754	0.0020
Indeno(1,2,3-cd)pyrene		0.6 / 6	0.0027	0.1254	0.1543	0.8271	0.0075
Naphthalene		0.01 / 0.1	0.0053	< 0.001	0.0857	< 0.004	0.0143
Pyrene			0.0171	0.9849	1.5780	1.1033	0.0593
Phenatrene		0.05 / 0.5	0.0107	0.2514	0.4372	1.4688	0.0436
Fluoranthene		0.3 / 3	0.0198	0.9336	2.9211	4.3690	0.0646
Fluorene			0.0006	0.0064	0.0142	0.0437	0.0069
Chrysene		1.1 / 11	0.0050	0.2242	0.3069	1.1679	0.0143

<sup>1</sup> The Threshold Limit Value (TLV) of contaminants were determined according to Hygienic Norms GN 2.1.5.1315-03 "Threshold Limit Values (TLV) of chemical substances contained in water of water bodies for drinking and household water use" and Hygienic Norms GN 2.1.5.2280-07 "Threshold Limit Values (TLV) of chemical substances contained in water of water bodies for drinking and household water use". **Supplements and amendments ?1 to GN 2.1.5.1315-03".**

<sup>2</sup> Limit values for dredged sediment sea disposal, concentration below first value no limitations, concentration exceeding second value disposal not accepted. The limit values are normalised for organic matter and fines. Analysis results are not normalised. The Finnish Ministry of the Environment 2004, guidelines for sediment dredging and disposal.

### 3.3.8 Priority hazardous waste sites

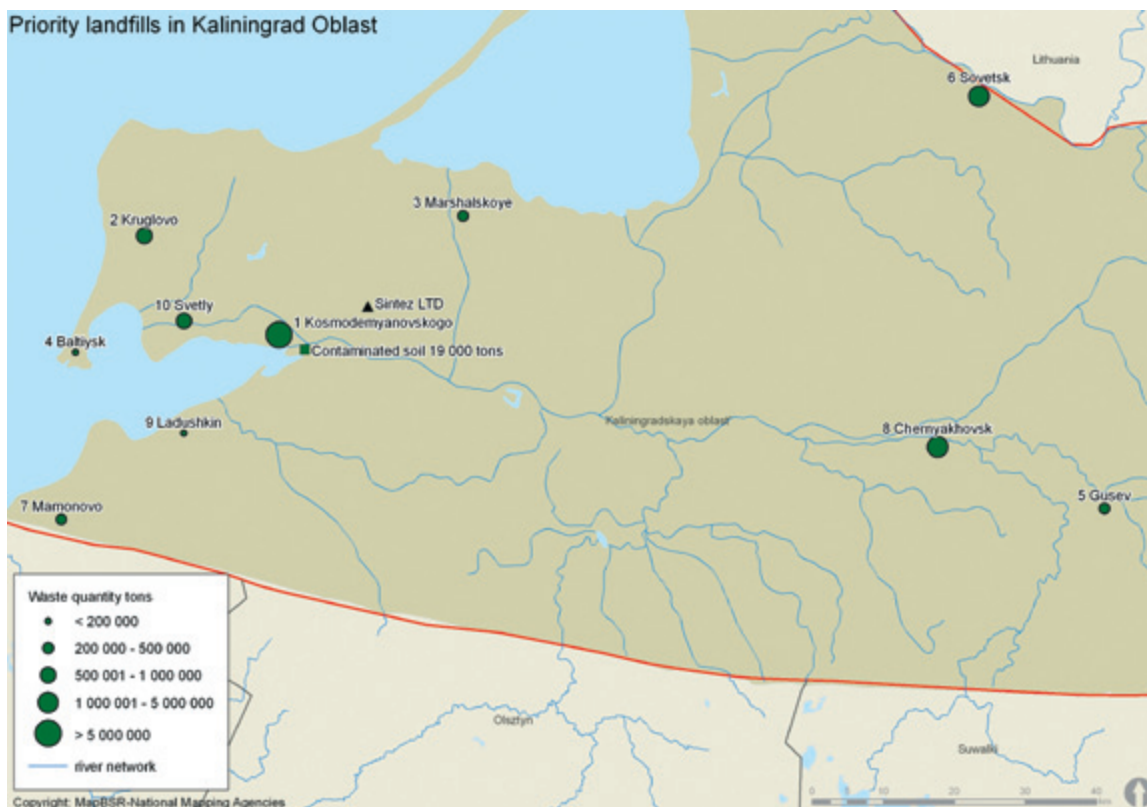
The most important landfills and hazardous waste sites were selected based on the proposal of Kaliningrad Oblast administration and on environmental risks (cf. Chapter 5.1).

The priority landfills are shown in Figure 18 and information on these landfills is presented in Appendix II. Photos of one of the priority landfills, the Kruglovo landfill, are shown in Figure 19 and Figure 20. The Kruglovo landfill is the only one in the Kaliningrad region that takes industrial waste of hazard class III.

According to the local authorities, none of the landfills contains industrial waste of hazard class I or II.

Most of the priority landfills are large by volume. Eight of the ten landfills are active and managed and two are closed. The oldest started operations in the 1960s and the youngest in 1991.

Seven of the priority landfills are located in the western part of KO near the Baltic Sea. These large landfills with no or inefficient leachate collection have close connection to the Baltic Sea. By far the biggest is the



**Figure 18:**  
The most important waste sites of Kaliningrad Oblast

Kosmodemyanskogo landfill of the City of Kaliningrad with annual disposal volumes of nearly one million tonnes. Three other priority landfills are also located in the catchment areas of the main rivers.

In addition to the above-mentioned landfills and dumps, other activities were identified as potential hazardous waste sources. They are:

#### *Kaliningrad port oil storage*

Kaliningrad Port Oil Storage is an old transit port for oil products and a site for treatment of ballast waters. The soil of the port is heavily contaminated with oil and needs measures to prevent leaching of oil into the Baltic Sea.

#### *Syntez Ltd.*

Syntez Ltd. collects and demercurises mercury-containing lamps. Extracted and deactivated mercury is stored on-site. High amounts of lamps are stored waiting for treatment.

### 3.3.9 Conclusions

The main problem of the hazardous waste management in KO is the lack of treatment capacity for hazardous wastes. The collected hazardous wastes are stored in industrial facilities, in one official/legal hazardous waste



**Figure 19:**  
Waste pond at Kruglovo for disposal of used food oil and grease, classified as hazard class III.  
(Photo: © Risto Valo)



**Figure 20:**  
Kruglovo landfill, edge of waste fill.  
(Photo: © Risto Valo)

temporary store or in other storages. There is one storage site in KO for mercury removed from mercury lamps. Previously hazardous wastes were sent to St Petersburg to the Krasny Bor hazardous waste landfill.

Separate collection of hazardous wastes from households is not organised and therefore nearly all hazardous wastes from households are mixed with municipal wastes and disposed at MSW landfills.

Monitoring and analysis of landfill leachate for hazardous substances are not systematically organised. There is no reliable information available on hazardous waste compound impacts from landfills on the environment. There are no modern landfills, for example the bottom structures do not correspond to modern requirements.

Lack of regional waste management policy hinders progress in waste recycling, waste minimisation and reduction of illegal small landfills. The administrative system governing MSW management is complicated.

The main concerns and risks of hazardous wastes in KO to the Baltic Sea can be summarised as follows:

- There is no collection and treatment of landfill leachate ; about 300 mm of rainwater infiltrate annually into landfills and leach through the waste into the environment;
- None of the major landfills has constructed tight bottom layers to prevent filtration of leachate;
- Oily waste from land, at coastlines and at sea, oil-contaminated soil;
- Hazardous waste storage and transport, one permitted storage is available in KO;
- Lack of incineration capacity for treatment of organic hazardous wastes;
- Lack of separate collection of hazardous wastes of classes I to III from households (batteries, lamps, thermometers, electronic waste, etc.);
- Industrial (as well as municipal) wastewater treatment is deficient and often does not meet the requirements, wastewater is a source of heavy metals and other hazardous wastes to the Baltic Sea.
- Current monitoring practices are not sufficient to provide reliable information on impacts of landfills on water bodies, especially with regard to hazardous substances.

# 4 Proposals for improvement regarding hazardous waste management



## 4.1 Improvements in practices and legislation

### 4.1.1 Introduction

This chapter provides proposals for improvement regarding the hazardous waste management regime and practices in St Petersburg and in Kaliningrad and Leningrad Oblasts.

The proposals for improvement are developed based on the gaps identified in hazardous waste management regulations and practices. The purpose of this chapter is to provide proposals for the most important and/or urgent improvements.

The proposals are based on the principle that hazardous waste management needs to be financially sustainable and that it is impossible unless the legislation supports environmentally sound management and laws are enforced.

### 4.1.2 Regulation

#### *Legal issues*

- A clear definition of “hazardous waste” in legal documents and all bylaws, including harmonisation of definitions from different sectors of the law (environmental, criminal, etc.), aimed at a better understanding of hazardous waste as such;
- Based on that, special legal regulations concerning this type of waste (i.e. stricter and clearer requirements for the hazardous management sector).
- Clear and concrete punishments for violation of legal waste management regulations.

#### *Institutional issues*

- Division of responsibilities among different authorities (federal vs. regional, environmental and communal, etc.);
- Better understanding of hazardous waste formation in the region;

- Authorising the relevant authorities to control enterprises;
- Data exchange and regular monitoring tasks to be shared among such authorities. Harmonised database (e.g. a hazardous waste register) might be created for management support (referring to the current uncertainties with hazardous waste amount and streams).
- Requirements on waste-handling companies should be streamlined to provide better control and transparency for all operations (licensing, monitoring, etc.).

#### *Financial issues*

- Establishing economic incentives for hazardous waste producers/handling companies for improving their management, such as marketing waste for possible re-use or treatment, raising penalties for illegal disposal and hazardous waste handling, etc.

### 4.1.3 Practices and handling

#### *HW cycle stages:*

#### *Waste collection*

- Study of the amounts and types of hazardous waste produced by the enterprises in the regions;
- Separate collection of certain types of hazardous waste (Hg lamps, thermometers, accumulators, batteries, motor oil, etc.) by households;
- Separation of hazardous waste during waste processing at transport companies.
- Waste treatment
- Introduction of more efficient technologies for luminescent lamps, electronic waste (mainly plastic-dust issues) treatment;
- Additional facilities for medical waste treatment (Leningrad and Kaliningrad Oblasts) where current capacity is insufficient;
- New capacity for other types of hazardous



waste treatment and utilisation (e.g. for solvents, paints, batteries and accumulators) depending on an in-depth analysis of hazardous waste formation.

#### *Waste disposal*

- Improving wastewater treatment at the Krasny Bor site (in the process of implementation, but not yet finished);
- Reclamation of old/historical dumping sites that might contain hazardous waste using more effective/or pilot technologies (referring to the Ust-Tosno site which was simply covered with soils). These might include reduction of the area used for waste disposal by piling waste if the waste quantity is not very large; proper covering of waste, and collection and treatment of leachate;
- Creating a special hazardous waste polygon in Kaliningrad Oblast (currently lack of own facilities);
- For operational MSW landfills, collection and treatment of leachate as they contain hazardous waste from households. Covering of waste in landfills in areas not filled with waste any more. Separate areas at landfills for contaminated soils and ash from heavy fuel oil so that contact of rain water with waste can be minimised and the most contaminated leachate separately collected and treated. To facilitate controlled operation of landfills, as the first improvement action, a filling plan needs to be developed. As part of the filling plan, the state of the landfill should be studied:
- Treatment of oily waters at operational and closed landfills. In many MSW landfills there are ponds for oily waters that can leach into the surroundings and further into the Baltic Sea.

## **4.2 Improvements of landfills**

This chapter provides lists of improvements to upgrade landfills with the aim of minimising adverse environmental impacts on surface waters or groundwater.

#### *Existing landfills*

- Minimisation of the operational area of the landfill for disposal. This is usually planned in a site-specific disposal plan.
- Preliminary covering of areas of the operational landfill where active disposal ends. This must be carried out so that clean rain

water flows off the covered landfill and does not filtrate into the waste.

- Disposal or treatment of the most harmful waste fractions elsewhere in places designed for such hazardous waste treatment/disposal. Controlled disposal of different hazardous waste fractions, e.g. sludge including hazardous substances;
- Construction/rehabilitation of adequate peripheral trenches bordering the landfill to avoid dispersion of polluted surface water into the environment;
- Construction of subsurface drains around the landfill to reduce filtration of contaminated leachate into groundwater;
- Constructions to stop undesired flow of leachate waters (e.g. directing wall)
- Keeping clean waters and contaminated waters separated;
- Controlled flow of clean surface waters to the environment;
- Collection of polluted surface waters. Sedimentation as minimum treatment;
- Treatment of contaminated waters according to local possibilities. Discharges to the municipal wastewater plant, if possible. Sedimentation as minimum treatment;
- Final capping of the landfill according to a disposal plan.

#### *Closed landfill*

- Sloping the landfill towards the edges so that rain water does not accumulate on the landfill and filtrate into the waste;
- Preliminary covering of the landfill in cases when final covering is postponed;
- Construction/rehabilitation of adequate peripheral trenches bordering the landfill to avoid dispersion of polluted surface water into the environment;
- Constructions of subsurface drains around the landfill to reduce filtration of contaminated leachate into groundwater;
- Collection of polluted surface water during closure works;
- Collection of polluted surface waters. Sedimentation as minimum treatment;
- Treatment of contaminated waters according to local possibilities. Discharges to the municipal wastewater plant, if possible. Sedimentation as minimum treatment;
- Top soil capping on top of the waste;
- Renovation of liquid waste basins; management of water e.g. as overflow or by evaporating, adsorption into solid material or other adequate treatment.



Disposal of solid materials into a landfill, covering or transport off the site for further treatment elsewhere.

The site-specific conditions, such as geology, hydrology and soil topography, determine and should guide the planning of upgrade and closure works of landfills.

The main principles of the upgrade and closure works are similar for non-hazardous and hazardous waste landfills, but the requirements set for hazardous waste landfills are stricter than for non-hazardous waste landfills.



# 5 Priority landfills and dumpsites



## 5.1 Introduction

The priority landfills and dumps of St Petersburg, LO and KO are presented on maps in Chapter 3. Further information on them is presented in Annex II. The priority sites were chosen based on proposals from the authorities in the region and on the environmental risks to the Baltic Sea. The following criteria were used as the basis for selection:

- hazardous waste quantity, content and quality;
- size and volume of wastes of the landfill;
- age of the landfill (higher risk of industrial waste disposal at landfills prior to 1991);
- location in relation to the Baltic Sea (in catchment areas higher risk of leachate into the Baltic Sea);
- direct water connection from the landfill to a river in the catchment area;
- tight natural or constructed bottom structure;
- control, monitoring and/or collection of leachate water.

All in all, the available information for risk characterisation was limited. Important input data, hazardous waste quantity or type, were not known for most of the landfills or dumps. Such information was available only for the Krasny Bor polygon in LO and for the Kruglovo landfill in KO. Disposal of industrial waste of hazard classes I and II is not allowed in MSW landfills. However, all MSW contains hazardous waste from households. Therefore the size of MSW landfills was considered to indicatively illustrate hazardous waste quantity. Disposal destination for industrial waste of hazard classes I-III was not fully clear. In St Petersburg and LO waste hazardous classes I-II should be disposed at Krasny Bor. In KO also, industrial waste of classes I-II should have been shipped to Krasny Bor until the beginning of 2009. Related to oily waste, there is some uncertainty regarding disposal.

Landfills which according to expert judgement do not pose any major risk to the Baltic Sea were not included in the priority list. Such excluded

landfills are, for example, those located far away from water bodies or those that include only IV or V hazard class waste, or their waste quantity is very small or in some cases of unauthorised dumpsites they have been eliminated according to the local municipalities.

## 5.2 Monitoring practices of priority landfills

### *Monitoring practices*

Assessment of landfill monitoring is based on the practices of the ten priority landfills in Kaliningrad Oblast. Seven of the ten priority landfills in Kaliningrad Oblast are monitored for outdoor air and for soil within the SPA of the landfills. Groundwater is monitored outside two landfills and surface water outside two landfills. The monitoring programmes differ somewhat at different landfills but mainly include hygienic indicators, heavy metals, pH and oil products (soil) and sulphur dioxide, ammonium, formaldehyde, hydrogen sulphide, benzene, alkanes, carbon dioxide, carbon monoxide and methane (outdoor air).

Some kind of environmental monitoring is carried out at most of the active landfills. No regular monitoring is made at closed landfills. Monitoring focuses on air and soil, but monitoring of water is carried out less often.

**Atmospheric air** of the landfill or within the sanitary protection zone is typically monitored for gases, such as nitrogen oxide, nitrous oxide, ammonium, hydrogen sulphide, sulphur dioxide and carbon monoxide. At some landfills, also other parameters, such as benzene, saturated hydrocarbons, particle matter, formaldehyde, methane and carbon tetrachloride, are monitored. **Soil** within the landfill or up to 500 metres distance from the landfill (within the Sanitary Protection Area) is typically monitored for heavy metals (Cd, Cu, Zn, Cr, Ni, Pb, Hg, As), but at some landfills petroleum products, sanitary and hygienic indicators and pH are monitored. **Groundwater and surface water** are analysed only at a few landfills. Groundwater monitoring points are located outside the landfills or in a nearby

village at a distance of more than 500 metres from the landfill. Groundwater is monitored at two landfills for heavy metals, nitrates, nitrites and ammonium as well as chloride, sulphate and pH. A nearby river or stream is monitored outside two landfills for nitrates, nitrites, ammonium, DO, BOD<sub>5</sub>, COD, pH and/or odor.

**Leachate** (water that filtrates through the waste layer) is not monitored at any of the priority landfills and effective collection of leachate is not organised at any of the subject landfills. Organic hazardous substances and compounds are not compound-specifically analysed at any of the landfills. **Landfill gas** emissions or composition of gas in the waste fill is not monitored.

Monitoring practices of each priority landfill in KO are summarised in Appendix II. Only limited information on monitoring practices was available for the St Petersburg and Leningrad Oblast landfills. Hence it was not possible to analyse the practices.

#### *Monitoring results*

Groundwater outside the Iliecheva landfill (LF 3) is monitored at 500 m distance from the landfill for heavy metals (Mn, Cr, Cd, Cu, Pb, Zn, Ni, Hg and As). The recent analysis (September 2009) showed that the concentration of Hg was at the maximum allowed level of hygienic standard (0.005 mg/l) and that all other parameters were low and complying with the standard. The Kruglovo (LF 2) dug well was monitored for COD, ammonia, nitrites, nitrates, chloride, hardness, solids, sulphates, pH and calcium, but not for heavy metals or organic contaminants. The measured parameters complied with the hygienic standard.

Surface water of a creek located about 100 m from the Kruglovo (LF 2) landfill was monitored in August 2009 for solids, pH, dissolved oxygen, BOD<sub>5</sub>, COD, chlorides, sulphates, ammonium, nitrites, nitrates, iron, alkalinity, calcium, magnesium and heavy metals copper, lead and cadmium. All of these parameters showed to be within the hygienic standard set for each component. The Mamonovka River, flowing about 800 m from the landfill, was monitored in December 2008 for odor, color, pH, DO, BOD<sub>5</sub>, nitrites, ammonium and nitrates. The results, except for BOD, showed that all monitored parameters met with the hygienic standard.

No monitoring of organic contaminants or key heavy metals from leachate water is conducted

at any of the landfills. Surface water or groundwater outside the landfills is only monitored at some landfills, not at the major landfills. Information on leachate water and groundwater quality of the landfills would be important to evaluate the hazardous waste load from these sites on the Baltic Sea.

The recent results of monitoring (2007 to 2009) at the ten priority landfills in KO indicate that at none of the sites the hygienic indicators or other parameters are exceeded in soil or outdoor air.

#### *Assessment of monitoring practices*

As a conclusion it can be said that the current monitoring practices are not sufficient to provide reliable information on the impacts of landfills on water bodies. Based on the monitoring practices of the ten priority landfills in Kaliningrad Oblast, leachate is not monitored at all and groundwater and surface water are studied only at a few landfills. The analysed compounds include mostly compounds relevant to MSW landfills and only a few compounds specific to hazardous wastes are analyzed.

For the sake of comparison, typical monitoring practices of MSW landfills in Finland are summarised below. Leachate is analysed at all major Finnish landfills. The analysis includes concentrations of nutrients and other compounds as well as volumetric monitoring of water quantity. This allows mass balance calculations for leachate water components. Sampling is done usually of leachate flowing out from a landfill to the treatment facility. The frequency of analysis is typically four times a year.

Typical monitoring parameters of Finnish MSW landfill leachate are: pH, electric conductivity, Cl<sup>-</sup>, nitrogen (ammonium, nitrite, nitrate), COD, BOD<sub>7</sub>, P, solids, color and flow rate. These parameters are similar to the monitored compounds in Russian landfills. At industrial landfills in Finland also other parameters, such as oil hydrocarbons (C<sub>10</sub>-C<sub>40</sub>), can be included in the monitoring programme, depending on waste composition. Hazardous wastes are separately collected and disposed of or treated in Finland. Therefore these compounds are not present in municipal solid waste landfills.

In Finland groundwater outside landfills and surface water is also monitored. The frequency of monitoring is typically once or twice a year. Landfill gas is monitored from observation wells drilled into the waste fill. From the same

wells also the inner leachate water of a landfill can be monitored.

In Finland, the base of landfills contains an artificial sealing layer (plastic membrane) and a porous drainage layer together with a thick poorly permeable soil layer beneath these layers. This structure allows controlled collection of leachate, analysis of the composition and treatment of leachate in facilities such as municipal wastewater treatment plants, or treatment on-site in lagoons and biofiltration systems. The present Russian landfills in Kaliningrad Oblast, Leningrad Oblast and St Petersburg are not provided with such bases and thus controlled leachate management is not as efficient.

### **5.3 Assessment risks of the priority sites to the Baltic Sea**

The assessment of risks to the Baltic Sea is based on waste quantity, hazardous waste quantity, age of the landfill, leachate collection and treatment, base of the landfill, water connection to the Baltic Sea and results of monitoring when available. Risk characterisation for each priority site is presented in a table in Annex II.

Landfill risk assessment of the Tacis project in Kaliningrad Oblast classified the risks of the 161 sites as follows:

- category 1 and 2 sites are no-risk sites;
- category 3 sites are low risk sites;
- category 4 sites are low risk (4 sites) and medium risk (2 sites);
- all category 5 sites are medium risk sites;
- all category 6 sites are high risk sites.

Category 6 sites were estimated to contain about 93% of all landfill waste in Kaliningrad and category 5 sites 6% and categories 1 to 4 sites totally only about 0.8%.

Four of the category 6 landfills are located close to the Baltic Sea, to the west of Kaliningrad City. Because leachate collection at each of these landfills is either missing or inefficient, they will likely load the Baltic Sea.



# 6 Proposal for pilot cases



## 6.1 Introduction

This chapter provides proposals for pilot cases. The pilot cases are developed in collaboration with the regional environmental authorities based on the list of prioritised hot spots and proposals for improvement in waste management measures. The pilot proposals described in this chapter are supported by local authorities. All pilot project proposals, including also those not supported by authorities, are presented in Annex IX.

The information on hazardous waste formation, i.e. types and quantities, is crucial for any financially sustainable management activities. There is too little information available on the hazardous wastes of St Petersburg and Leningrad Oblast for planning, and Kaliningrad data are limited as well. A comprehensive inventory of hazardous waste formation would therefore be helpful to design suitable solutions in the correct capacities.

## 6.2 St Petersburg

### 6.2.1 Galvanic Waste Treatment

#### Goal

The objective of this pilot project is to improve the treatment of galvanic waste containing heavy metals and cyanides. Wastewater from galvanic processes typically contains high concentrations of Zn, Ni, Pb, Cr, Sn and other metals. The foreseen treatment would be to precipitate and reuse the metals in galvanic waste that presently are disposed at landfills.

#### Background information

Galvanic waste (GW) treatment has been identified as a waste management problem in St Petersburg. Currently the waste from metal working facilities containing high amounts of heavy metals is mainly disposed of in ponds at Krasny Bor (Figure 21) without any treatment. Some larger galvanic plants have their



**Figure 21:** Satellite image of the Krasny Bor polygon showing the three ponds used for galvanic waste disposal (arrows). (Image: © Google Maps™ mapping service).

own wastewater treatment plants and need no external collection.

Galvanic chemical plants (GCP) belong to the main sources of heavy metal (Cu, Cr, Ni, Zn, Cd etc) pollution of waters and soils in St Petersburg. The main toxic components of GCP are spent electrolytes and pickling solutions. Galvanic waste originates from preparation baths (degreasing and wet etching), surface treatment baths and rinsing baths. According to the information from the St Petersburg authorities, sludges are not a problem as they can be transported as such to Krasny Bor.

Currently St Petersburg enterprises lack a convenient, effective and economically reasonable treatment system for waste electrolytes and solutions. There are at least 40 companies that generate galvanic waste. Classes of hazard of galvanic waste are I (very hazardous), II and III. Earlier there were up to 400 plants. The dramatic decrease in this quantity and changes in economics have weakened the collection and transportation system of this type of industrial waste, which may lead to inappropriate waste management practices (dumping, discharging of wastewaters into the sewage system).

The only authorised and licensed disposal site for GCP waste in the North-West of Russia is the Krasny Bor industrial waste landfill. Waste is deposited in lagoons without treatment, a

process that does not meet modern environmental standards. Moreover, transportation of waste of high classes of hazard (I and II) also represents potential environmental risk. By reduction of galvanic waste volumes, lowering of their classes of hazard and introduction of recycling considerable environmental benefits can be achieved.

#### *Pilot proposal*

The main idea of the pilot project would be to reduce the risk of galvanic waste entering the environment and to provide environmentally sound management of such waste.

The project would include the following elements:

- inventory of galvanic waste producers;
- analysis of the presently used treatment techniques;
- analyses of available technology to improve treatment; and
- improvement of collection and treatment.

#### *Benefit to the Baltic Sea*

Reduced risk of inappropriate management of galvanic waste and reduction of heavy metal and etching agent load onto the Baltic.

#### *Time requirement for implementation*

The estimated time for inventory of galvanic waste generation and analysis of present and available new treatment technology is about 12-15 months.

#### *Cost estimate*

- Background study: 30,000-50,000 euros;
- Improving treatment:  
In principle there are two foreseen options: stationary treatment at each enterprise or mobile treatment designed in St Petersburg. The rinsing solutions are fairly uniform by composition in all galvanic processes and could be treated relatively easily. Stationary solutions placed at metal plating enterprises cost approximately 150,000 euros. However, it is not possible to estimate the technologies needed for treatment of bath solution without specific knowledge of the process.
- Indicative cost-estimate for the mobile solution is in the order of magnitude of 200,000 euros.

### **6.2.2 Feasibility/Contamination Study for the Unauthorised Ust-Tosno Landfill**

The 15 ha landfill located near the Krasny Bor hazardous waste polygon contains roughly 400,000 m<sup>3</sup> of waste. There is a ring channel immediately surrounding the landfill, which leads to the Bolshaya Izhorka River on the catchment of the Baltic Sea. The leachate from the landfill contains high amounts of Al, phenols, and oils, suggesting that hazardous waste have been placed on the landfill.

Before considering rehabilitation of the landfill, a study of the contamination would be necessary to identify the threat to the Baltic Sea. In this pilot project, the waters from the landfill would be analysed for hazardous substances to identify whether measures should be taken and possibly a rehabilitation plan developed.

#### *Benefit to the Baltic Sea*

Reduced load of hazardous substances from the old unauthorised landfill. Demonstration project on background study, planning rehabilitation and preparing the required technical description.

#### *Time requirement for implementation*

9-12 months.

#### *Cost estimate*

- The technical planning project organised by the Environment Committee of St Petersburg has been estimated to cost approximately 150,000 euros;
- Rehabilitation of the landfill: indicative cost estimate is 1-5 million euros.

### **6.3 Leningrad Oblast**

#### **6.3.1 Treatment of Mercury-Containing-Waste at Kirpichniy Zavod**

##### *Goal*

The goal of this pilot project is to assess and plan the potential reduction of the environmental threat caused by illegal storage of mercury-containing lamps in the old industrial area of Kirpichniy Zavod (brickworks) in the Vsevolozhsky District of Leningrad Oblast.

##### *Background information*

Kirpichniy Zavod (Figures 22 & 23) is an old

industrial facility area where used fluorescent lamps are stored illegally in an unfinished building. The lamps accumulated on the site between 1986 and 1993.

The experts have estimated that in 2006 the amount of stored lamps exceeded one million, containing several kilograms of mercury (according to Russian information, a lamp may contain up to 80 mg Hg, which is high compared to the European 5 mg per lamp). The nearby unauthorised dump is polluted by mercury-containing lamps.

The Kamenka River is located at approximately one kilometre from the site and the Neva River at 15 km. The villages and the town of Vsevolozhsk in the surroundings of the mercury store are potentially within the zone of mercury exposure.

In 2006, the programme “Environmental Protection of the Leningrad Oblast in 2007-2010” was approved. The work for the removal and demercurisation of stored luminous lamps was included in this programme. In four years about 250,000 euros have been allocated for the cleaning of mercury contamination and demercurisation of the used lamps. In 2007, about 300,000 lamps were removed and by the end of 2010 the whole lamp store is estimated to be emptied.

The soil around the storage building and the structures itself are likely to be contaminated by mercury. Contaminated soil has been remediated in connection with the LO project, but the methods used are not known to the consultant. The view of the local experts was that there is no need for mercury-contaminated soil remediation.

#### *Rationale for the pilot project*

Metallic mercury is easily volatile and toxic to humans and to the environment. It can be removed from the global cycle only by stabilisation as non-volatile sulphur compounds. This is carried out in the demercurisation process. By stabilisation gaseous emissions as well as leaching of mercury to the environment can be prevented. To assess the need for remediation of constructions and, if needed, of the soil outside, the degree of contamination should be studied. The lamps should be destroyed. It is to be noted, however, that many mercury lamp destruction facilities in Russia do not stabilise mercury but recycle it to the mercury market.



**Figure 22:**  
Kirpichiy Zavod lamp storage.  
(Photo: © Timo Seppälä)



**Figure 23:**  
The lamps have been  
piled inside the storage  
in four rooms.  
(Photo: © Timo Seppälä)

#### *Pilot proposal*

The pilot proposal includes:

- Contamination study of constructions and if needed, of the soil in the brick factory area
- Environmentally sound destruction of mercury-containing lamps

#### *Potential risks*

- Costs of building materials remediation can be higher than estimated because no detailed inventory of structure contamination has been conducted.

#### *Benefits to the Baltic Sea*

Mercury contamination is a potential threat to the Baltic Sea. Demercurisation would lower the risk. The risk of mercury polluting the Baltic Sea is, however, relatively low.

#### *Time requirement for implementation*

4-6 months.

#### *Cost estimate*

100,000 euros.



## 6.4 Kaliningrad Region

### 6.4.1 Fuel transfer complex “Kaliningrad Sea Fish Port”

#### Goal

**Figure 24:**  
Satellite image of the  
Kaliningrad fuel-transfer  
complex showing the oil  
unloading quay (right)  
and the tar pond (left).  
(Image: © Google Earth™  
mapping service)



The goal of this pilot project is to cease leakage of oil hydrocarbons from contaminated soil in the fuel-transfer complex, as well as to improve ballast water treatment. The port is located by the Prigolya River (Figure 24) and has direct flow connection to the Baltic Sea.

#### Background information

The fuel-transfer complex practises the following main activities:

- trans-shipment of over 1.5 million tonnes per year of oil products, of which 80% is crude oil; and
- reception and treatment of ship hold and ballast tanks (about 14,000 m<sup>3</sup>/a) and other oil-containing water fractions.

The contamination of the site was investigated in 2000 by an expert company. According to their report, the amount of oil-contaminated soil was estimated to be 19,000 m<sup>3</sup>. The shore line of the Pregolya River was largely classified as highly contaminated. The soil has become contaminated gradually during over sixty years of fuel-terminal activities.

Separation of oil from ballast water has been developed and several methods are used. The fuel transfer complex is currently the only enterprise in Kaliningrad Port that takes oily waters for treatment. The final residue of water treatment is a concentrated tar-like oil sludge containing heavy oil. Presently this tar is stored in an open pond (cf. Figure 24), but treatment of this sludge by stabilisation and by incineration has been developed and tested. At the time of the site visit (17.7.2009), oil was

leaching from the soil to the Pregolja River and further to the Vistula Lagoon that has access to the Baltic Sea. The seeping oil was removed from the water in front of the quays with oil booms. Soil contamination has not been investigated in detail and the extent of contamination is not known. The investigation report of 2000 has not been available to the consultants for review for this pilot proposal. Measures for remediation of the oil-contaminated soil have been called for several times but the costs have been too high for the enterprise.

The sources of oil to the Pregolya River are contaminated soil and discharge of treated process sewage (about 230 m<sup>3</sup>/d). The treatment plant is working as an enterprise since 1976. The enterprise operates the water treatment plant (German Baker Process) since 2007 and the sludge disposal pond. The efficiency of the treatment plant is insufficient and does not meet the local hygienic norms.

This site belongs to HELCOM JCP List of Hot Spots (hot spot number 711) of sites that pollute the Baltic Sea with harmful substances.

#### Rationale for the pilot

The pilot project would focus on remediation of oil-contaminated soil and of the oil sludge pond, as well as on improvement of the treatment facility for oily waters. Soil remediation would start in the most urgent areas concerning access of oil to the Prigolya River. The enterprise has taken measures to prevent additional contamination of soil by spills and reduced the amount of oil in treated sewage discharged to the river.

The present level and extent of oil in the soil is so high that it remains a continuous source of oil to the river. The fuel transfer complex is mentioned as the main source of oil-contamination of the Pregolya River. Based on previous investigations, the maximum concentration of oil in the soil is about 10% (100 g/kg) and the average contamination approximately 40 g/kg.

#### Pilot proposal

The pilot proposal includes three phases:

Phase I: Review of previous soil investigations, detailed further investigation of soil contamination with sampling and laboratory analysis. Remediation of the oil sludge pond (800 m<sup>3</sup>);



Phase II: Choosing of method(s) for remediation of contaminated soil and planning of contaminated soil remediation;

Phase III: Contaminated soil remediation and improvement of present ballast water treatment techniques and facility.

#### *Indicative cost estimate*

The costs of the pilot project would require external financing (HELCOM and other sources) and own financing by the fuel transfer complex (not yet officially confirmed by the company). The costs of remediation are dependent on the selected remediation techniques and can be assessed accurately only after Phase I complementary investigations and Phase II selection of remediation methods.

Indicative cost estimate for external financing is:

- Phase I soil investigations: 50,000-90,000 euros;
- Phase II remediation planning: 60,000-120,000 euros;
- Phases I, II and III in total: more than one million euros.

It is proposed that the fuel transfer complex would cover the costs of sludge storage remediation, improvement of present treatment facilities and monitoring of discharged water.

#### *Benefits to the Baltic Sea*

Remediation of the fuel terminal would decrease hydrocarbon loading of the Pregolya River and the Baltic Sea and likely remove the site from HELCOM's list of priority hot spots.

#### *Time requirement for implementation*

Stage I: six months

Stages I to III in total up to three years.

### **6.4.2 Improvement of Mercury-Containing-Waste Management in Kaliningrad Oblast (by Eco-Centre Ltd)**

This pilot project was developed by Russian consultants Eco-Centre Ltd. The views of the working group in Kaliningrad, the EU consultant Pöyry Finland Oy and Finnish Environment Institute were taken into account.

#### *Goal*

Decrease of mercury compound pollution by

collection and treatment of municipal mercury-containing-waste (MCW).

#### *Background information*

There are no facilities for treatment and treatment of hazard class I-III wastes or sites for their environmentally friendly disposal in Kaliningrad Oblast except for oil-containing waste. Mercury-containing waste, which is hazard class I waste, is generated by enterprises, municipal institutions and households. According to the data of Rostekhnadzor, the volume of MCW generated by enterprises that report annually on the volume and composition of produced wastes is 30 metric tonnes per year. Municipal MCW, which is waste generated by municipal institutions (schools, hospitals, public buildings of different ownership and departmental membership) and household MCW are not taken into account.

Presently, the collection of MCW from municipal institutions (mainly mercury-containing lamps) is quite satisfactorily arranged only in Kaliningrad City, although MCW generated by households ends up in landfills in the mixture of MSW (municipal solid wastes). Landfills (dumps) of MSW in Kaliningrad Oblast do not meet the environmental and sanitary requirements being thus sources of pollution to the oblast and to the Baltic Sea. They do not have an underlying waterproof layer or system of leachate collection and treatment, which is why the filtrate pollutes surface and groundwater, and finally the Baltic Sea with hazardous substances, including mercury compounds.

Only one enterprise in Kaliningrad Oblast, OOO Syntez Ltd practises treatment and utilisation of MCW. The enterprise has been working since 1989. Since 1992 it has been collecting different kinds of mercury-containing waste (all kinds of lamps, mercury-containing devices). The enterprise has an area about 1 ha in an industrial zone at the northern outskirts of Kaliningrad. The production facilities comprise:

- administrative building - one-floor building 6 x 8 m<sup>2</sup>;
- industrial building – metal shed with open storage of luminous lamps on shelves; and an isolated room with a treatment unit for luminophor extraction.

Syntez Ltd. uses the electric system of the adjacent enterprise. Allowed electric load is 25 A/hour. The lack of reserves for electric capacity limits the expansion of the present demercuration process.

From 1992 to 1996, the enterprise used a plant, URL-2M, whose final product was metallic mercury. The mercury obtained from the treatment of MCW was transferred for storage in the laboratory of the Department of GO ChC of Kaliningrad Oblast.

Since 1996 the enterprise has been using the plant designed by the enterprise. The technology of MCW treatment is based on mechanical separation (shake table) of metal caps, glass and luminophor. The plant is certificated.

The end products of MCW treatment are:

- metal caps (hazard class IV) – transferred to be used as recyclable materials;
- glass breakage (hazard class III) – buried in the landfill of Kruglovo;
- mercury-containing luminophor contaminated with glass dust – stored at the enterprise.

Mercury vapours are recovered from the demercurisation unit by vacuum and adsorbed in cloth filters.

Mercury is not utilised in the oblast. Before 2000 mercury was removed in Krasny Bor. Now mercury is being accumulated at Syntez Ltd and the laboratory of GO ChS.

By the end of 2009, in the area of OOO Syntez Ltd 12 metric tonnes of luminophor had accumulated during previous years. One tonne of luminophor contains 2 kg of mercury; therefore, the accumulated luminophor contains 24 kg of mercury.

The treatment capacity of the plant used by OOO Syntez Ltd is 250,000 lamps per year. The plant is not using its full capacity. 200,000 lamps were processed in 2007, 145,000 in 2008, and about 90,000 lamps had been collected and processed by the end of 2009. The decreasing volume of treatment is not caused by a decrease in the consumption of mercury-containing materials and equipment but rather by high tariffs for the treatment of MCW. The cost of transportation from the place of its generation to Kaliningrad increases the cost of utilisation for consumers.

The main mass of MCW is generated in Kaliningrad City and its suburbs.

The present demercurisation process in KO is not environmentally sound because the end product of mercury remains class I HW. The capacity is also too low to treat all used

mercuric lamps produced in KO. The purpose of the pilot project is to find a modern technology (compatible with BAT) with capacity to treat all used lamps in KO. The location of the new demercurisation unit should be based on mercuric waste inventory, logistics, economy and appropriate infrastructure of the site, including availability of electricity.

About 600-700 enterprises use the services of OOO Syntez Ltd. of which 70% deliver the waste themselves, while the transportation from the others is provided by Syntez Ltd.

Syntez Ltd. has a municipal contract within which it collects MCW generated by municipal institutions of Kaliningrad (schools, kindergartens, hospitals). About 25,000 lamps are collected from municipal institutions annually. Removal takes place every three months.

The last contract for the collection of MCW from municipal institutions in Kaliningrad Oblast financed by the oblast budget was signed in 2005. Within this contract, about 30,000 lamps were collected from all municipal institutions of Kaliningrad Oblast (excluding Kaliningrad City).

Because of lack of financing, municipal MCW is now collected inefficiently in Kaliningrad Oblast. The organisation and financing of mercuric lamps collection is the task of municipalities and it should be developed by responsible organisations.

Some municipalities (Chernyakhovsk, Sovetsk and Svetly) have signed contracts with Syntez Ltd. for the treatment of municipal MCW. Some municipal institutions have signed direct contracts with the company for the utilisation of MCW (for example, kindergartens which can get money from parents). As a result of the absence of financing, the amount of waste collection from municipal organisations in the oblast has been reduced to 5,000 lamps per year.

After information about the company was published in the media, requests for the removal of mercury lamps from citizens have arisen. However, uncoordinated requests and lack of financing of MCW collection from households do not provide for profitable collection and treatment of this waste.

According to the data of Syntez Ltd. the annual volume of sales of power-saving lamps is about 120,000 per year. The consumption of mercury

lamps is expected to increase in the near future because the production of incandescent lamps is now being reduced. Moreover, according to the Federal Law "On energy savings" passed in November, 2009, their sale in the RF will end by the year 2014. It means that by 2014 households will be using only mercury lamps. Therefore, the prevention of the entry of household mercuric lamps in landfills is a timely and urgent task.

Within this project the generation of MCW in KO will be assessed. The treatment option will be analysed and a strategy developed containing activities targeted to ensure the environmentally sound collection and treatment (BAT-compatible) of Hg waste. Collection of MCW from households will be demonstrated in one pilot district. The location, treatment method and equipment of MCW will be recommended as the final phase based on the PP results.

### Summary

- The enterprise, Syntez Ltd., which is at present the only operator in this area, practises treatment and utilisation of MCW in Kaliningrad Oblast;
- The technology applied by Syntez Ltd. is not modern and does not provide proper ecological and occupational safety because the result of the treatment still contains mercury (metallic Hg) which requires Class I Hazardous Waste disposal or extraction of metallic Hg for reuse.
- However, current technology provides a decrease in the volume of MCW and control over its accumulation and storage.
- Resources for the technical re-equipment and modernisation of the production of Syntez Ltd. are lacking, mainly because of insufficient electric energy available.
- Collection and treatment of municipal MCW is organised only for municipal institutions in the city of Kaliningrad; MCW of the other municipalities is mainly accumulated at the places of their generation or enter the landfills in MSW.
- The volume of generation of MCW in Kaliningrad Oblast is slightly higher than that in Kaliningrad City (30 thousand and 25 thousand lamps per year, respectively).
- MCW from households go to the landfills of MSW from where metallic mercury can be released mainly by evaporation to the atmosphere, but also to some extent in leachate.

- Based on federal waste statistics, the MCW (mercury lamps) from enterprises is about 30 tonnes annually.
- Regional authorities do not have trustworthy data on the amount of unaccounted MCW including that from households in Kaliningrad Oblast.
- The amount of MCW generated by households is expected to grow because of cutting down of the turnover of incandescent lamps and switching to mercury power-saving lamps due to the enforcement of the Federal Law of the RF "On energy savings".
- Resources for sustainable final disposal of products of MCW treatment (luminophor in current technology) are absent in KO. The only method for their utilisation in the current situation is to transfer these products to the special landfill Krasny Bor in Leningrad Oblast for disposal. However, this option is likely not accepted in LO at present. For this reason, the pilot project aims at finding a demercurisation process that transforms metallic Hg into a stable and safe product, i.e. mercuric sulphide.

### Tasks

This pilot project proposal is related to the improvement of treatment of mercury-containing waste (used lamps and thermometer) in the Kaliningrad region.

The pilot project can be divided into four parts:

- Assessment of amounts of MCW generated and treatment capacity in KO;
- Arrangement of a system of MCW collection from the population and municipal institutions in the pilot municipalities;
- Elaboration of the Regional Programme of measures for MCW;
- Improvement of technical resources for MCW deactivation in Kaliningrad Oblast.

### Activity 1. Assessment of MCW generation and management

- Assessment, analysis and forecast of volumes of MCW generation in Kaliningrad Oblast (Activity 2 will also provide information on the generation of MCW);
- Assessment of the current technical resources for MCW deactivation in Kaliningrad Oblast.

This is a two-phased activity. In the first phase, the volumes of formation of mercury-containing

waste in industry and households is estimated. Also, Activity 2 will provide information on the generation of MCW waste in households and municipal institutions. In the second phase, the need for improvements and changes in the present treatment practice is evaluated.

Activity 2. Creating strategy and plans for improvements

- Public awareness raising;
- Arrangement of a system of MCW collection from households and municipal institutions in the pilot municipalities (one urban settlement and one rural district containing several villages are planned as pilot municipalities);
- Testing of the example of pilot municipality organisational-financial mechanisms and technology for separate collection and deactivation of hazardous wastes from households.

The objective of the project is to study the possibilities of setting up a collection mechanism in a pilot district in order to make environmentally sound management of mercury-containing waste possible. This is closely linked with Activity 1 "Assessment of MCW generation and management". It is foreseen that the activity could be carried out by initiating collection of mercury-containing waste (fluorescent energy-saving lamps, Hg thermometers) in a pilot district. Temporary storages for discarded luminescent tubes should be organised in a pilot district in Kaliningrad Oblast, as well as transportation from temporary storages to the demercuration facility.

Activity 3. Elaboration of the Regional Programme of measures for collection, deactivation and utilisation of MCW from households and municipal institutions.

- Based on Activities 1 and 2, a regional programme of measures for collection, treatment and utilisation of MCW from households and municipal institutions is developed in close co-operation with the regional and municipal authorities in KO.

Activity 4. Improvement of technical resources for MCW treatment in Kaliningrad Oblast, potential investments based on Activities 1-3.

- An evaluation of the most appropriate solution for enhancement of MCW treatment in KO is made as a basis for a possible decision on the establishment

of a new installation for demercuration/upgrading of existing MCW technologies. Treatment capacity will be increased or existing technology improved, if needed, based on the findings of Activities 1-3.

Main participants in the project:

- The government of Kaliningrad Oblast will probably be presented by the work group of the
- BALTHAZAR Project;
- Administration of the pilot municipalities;
- Enterprises practising transportation and deactivation of wastes;
- Depending on the results of the analysis – Administration of municipality where additional equipment for deactivation of MCW may be set.

Summary of the activities within the project:

- Study of current and forecast of future volumes of generation and flows of MCW in Kaliningrad Oblast;
- Public awareness raising;
- Study of MCW management capacity;
- Finding out places for optimal setting of equipment for MCW deactivation taking into account current and future volumes and routes of transportation;
- Elaboration of the Regional Programme of measures for collection, treatment and utilisation of MCW from households and municipal institutions;
- Equipment of sites for MCW collection units in the pilot municipalities;
- Arrangement of a system of MCW collection in the pilot municipalities;
- Transportation and treatment of MCW collected;
- Putting into operation additional equipment for MCW treatment depending on the results of the project;
- Analysis of information on the project implementation and results, including sustainability;
- Organisational support of the project – obtaining of necessary permits, elaboration of drafts of standard-legal acts at regional and local levels, co-ordination of activities in detail with the main participants of the project;
- Dissemination of the project results for the North-West Region of Russia.

Expected project results:

- Getting trustworthy information and forecast of volumes of MCW generation in Kaliningrad Oblast;
- Analysis of MCW management;



- The Regional Programme of measures for collection, deactivation and utilisation of MCW from households and municipal institutions;
- Developing separate collection of MCW from the mixture of MSW in the pilot municipality;
- Involving the population in separate collection of MCW;
- Recommendations on MCW treatment and arrangement of MCW flows in Kaliningrad Oblast;
- Technical equipment of an MCW treatment facility in KO;
- Awareness of the municipalities in the Baltic Sea Region of the RF (Kaliningrad Oblast, Karelia, Saint Petersburg, and Leningrad Oblast) of the realisation and the project results.

#### Potential risks:

- Absence of a site for environmentally sound setting of equipment for MCW treatment. In this case, no purchase of equipment will be made; the project will be limited to the arrangement of a system of MCW collection in the pilot municipality and the spread of this experience.
- Lack of financing for treatment of the MCW collected within the project. There are no other sources of financing that could be proposed, except for federal, oblast and local budgets. The government of the RF has started to create a system for financing treatment of mercury-containing lamps. The stability of the project greatly depends on the accomplishment of this initiative.

#### *Benefits to the Baltic Sea*

A decrease in mercury pollution of the environment as a result of the removal of MCW from the mixture of MSW. The removal of mercury from waste sites and landfills will improve the quality of leachate and decrease the release of gaseous mercury from landfills.

#### *Indicative cost estimate*

	BALTHAZAR Euros	Co-financing Euros
Activity 1	30,000	0
Activity 2	25,000	20,000
Activity 3	25,000	3,000
Activity 4	25,000 / 460,000	30,000
Project management	15,000 / 10,000	
Total		
Activities 1-3 <sup>1</sup>	95,000	23,000
Activity 4 <sup>1</sup>	35,000 / 470,000	30,000
<b>Total</b>	<b>130,000 / 555,000</b>	<b>53,000</b>

<sup>1</sup> Including project management

## 7 Conclusions



The main challenges in hazardous waste management in all priority regions are related to the lack of treatment capacity and lack of collection of hazardous wastes. Collected hazardous wastes may be stored in industrial facility areas not conforming with the regulations for long-term hazardous waste storage. Specific problems were identified with final disposal of mercury recovered from fluorescent lamps, an activity that takes place in all three regions. Currently KO lacks a licensed ultimate disposal option for hazardous waste.

Separate collection of hazardous wastes from households is not organised in any of the regions and therefore nearly all hazardous wastes from households are mixed with municipal wastes and disposed of in MSW landfills. The risk caused by these is related to the hazardous waste content and the location of the landfill. The situation appears to be especially difficult for waste oils, for which treatment is available but the quality of it is not well monitored. It is possible that waste oil is incinerated.

The monitoring and analysis of landfill leachate for hazardous wastes is not systematically

organised. There is no reliable information available on hazardous waste compounds from landfills to the environment. There are no modern landfills constructed; for example, the bottom structures do not correspond to modern requirements. For instance, the St Petersburg landfills now in use were founded as early as in the 1970s.

The lack of regional waste management policy hinders progress in waste recycling, waste minimisation and reduction of illegal small landfills. The administrative system governing MSW management is complicated.

Medical waste management is a priority source for dioxins and furans into the air, but only potentially a risk to the Baltic Sea through slag and ash disposal operations. The role of this emission source will need further investigation. It is evident, however, that with the present management capacity, large amounts of disinfectants (due to management requirements for Class B waste) and potentially pharmaceuticals are being landfilled in MSW landfills. Medical waste management should be improved in the region.

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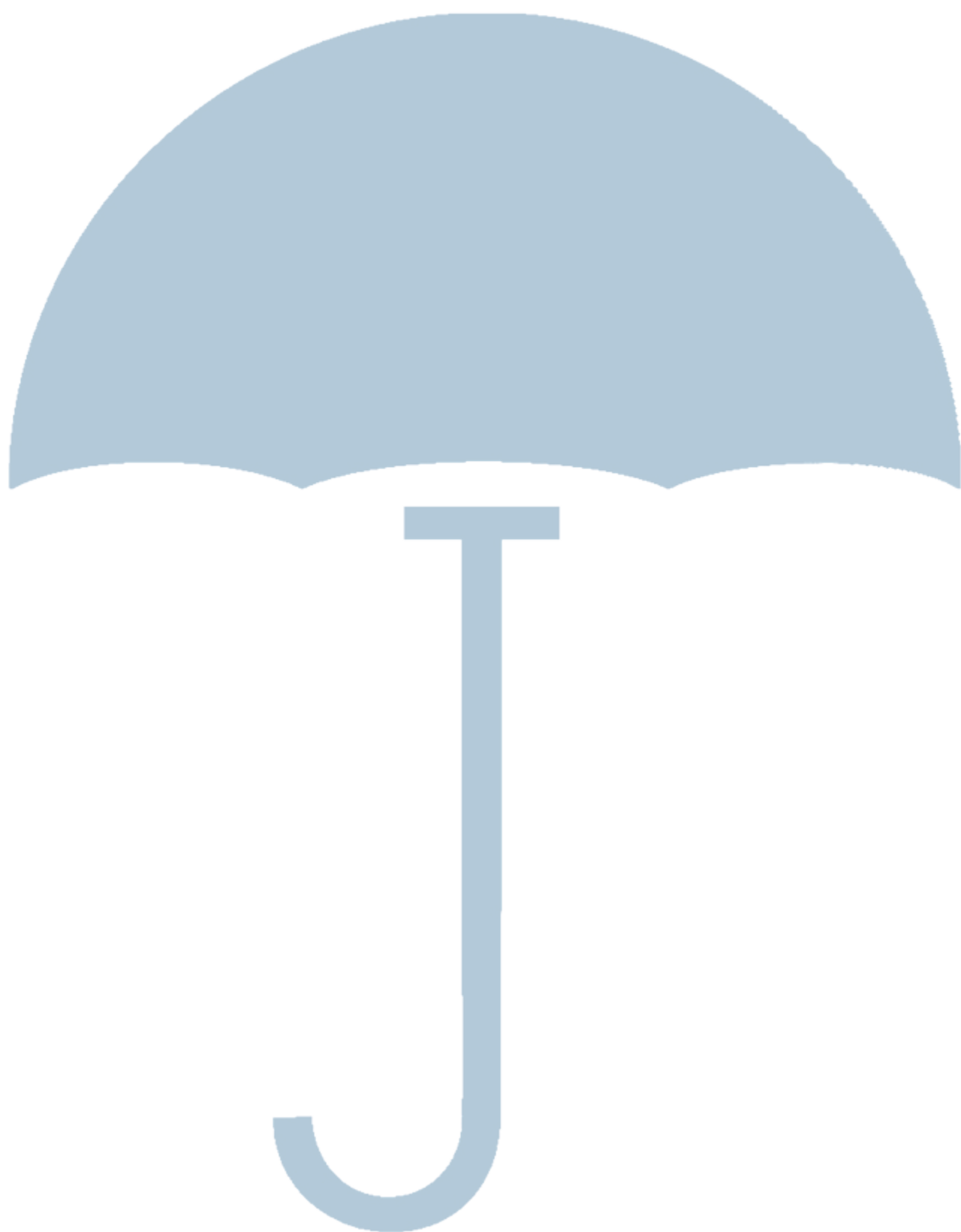
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**Helsinki Commission**  
**(Baltic Marine Environment Protection Commission)**  
*Katajanokanlaituri 6 B, 00160 Helsinki*  
*Phone: +358-207-412 649; Fax: +358-207-412 645*  
*[www.helcom.fi](http://www.helcom.fi)*

**Saint-Petersburg Public Organization**  
**"Ecology and Business"**  
*Post office box 66, RU-197342 St. Petersburg, Russia*  
*Phone: +7-812-430 6860; Fax: +7-812-430 9305;*  
*[www.helcom.ru](http://www.helcom.ru)*

# ANNEX 1a: LIST OF PRIORITY LANDFILLS AND DUMPS IN ST PETERSBURG

Pos. No.	Solid wastes dump-site location	Dump-site category	Year of dump-site operation	Waste quantity tons (1m³ = 0,8 tons)	Actual area	Active/Closed	Illegal/Managed	Annual volume of wastes disposal, m³	Hazardous waste quantity tons	Hazardous content and type including origin and chemical composition	Water connection to Baltic Sea (yes/no). If yes, distance to Baltic Sea (km)	Risk reduction measures in use (e.g. bottom structure, seepage water collection etc.)	Risk characterization (risk to the Baltic Sea)	Monitoring practices
1	Krasnyj Bor, LO Kolpino	Industrial waste landfill	1969	1 700 000	70 ha	Active	Managed, licensed	12 000 t	1,5 Mm³	Toxic industrial waste from various sources	No	Cambric clay bottom ca. 80 meters with permeability max. 10-8 m/s.	According to the authorities risk is low, as environmental measures are taken	Results unknown
2	Ust-Tosna, LO Kolpino	Illegal landfill	1970-1980's	400 000	15 ha	Closed	Illegal	-	No data	Industrial waste has been land-filled	Yes	No	Partly remediated, leachate to a river nearby, pollution of surface waters	No
3	PTO-1 "Volkhonka", border of the city and oblast, City South	MSW landfill	1978	7 Mt	70 ha	Active	Managed, licensed	No data	No data	Industrial waste and MSW	35 km by river flow	No waterproof artificial bottom. Natural cambric clay bottom more than 20 m. Leachate collection is organized. Mechanical leachate treatment (sedimentation).	Leachate may pollute ground and surface waters	
4	PTO-3 "Novoselki", Vyborgsky distr., Gorskoe shosse, 9 km	Landfill	1972	7,2 Mt	65 ha	Active	Licensed	2,5 Mt <sup>1</sup>	No data	Industrial waste and MSW	9 km/ 11,5 km²	No artificial waterproof bottom. Valdayskie clays (thickness is about 10 m) under waste. Ground water is founded higher than clay. Leachate collection exist, mechanical leachate treatment (sedimentation)	Leachate, pollution of ground, surface waters and air. Remediation design project is developed by the Committee for Natural Resources.	Unknown
5	Kupchinskaya, Frunzensky distr.	Dumping area	Closed in 1966	No data	27 ha	Closed	Was managed, no license	-	-	No hazardous waste	14 km	Remediated	According to the authorities no risk	Unknown
6	Ugolnaya Gavan, Kr distr.	Dumping area	Closed in 1980	6,4 Mt	110 ha	Closed	Was managed, no license	-	-	No hazardous waste	1,5 km	Remediated	According to the authorities no risk	
7	Yablonovskaya, Nevsky distr.	Dumping area	1952- 1978	No data	27 ha	Closed	Illegal	-	-	No hazardous waste	11 km	Remediated	According to the authorities no risk	
8	Primorskaya, Primorsky distr.	Dumping area	1960's-1990's	1,4 Mt	10 ha	Closed	Illegal	-	-	No hazardous waste	2 100 m	Partly remediated No artificial waterproof bottom. Valdayskie clays (thickness is about 10 m) under waste. Ground water is founded higher than clay. Leachate collection exist, but no leachate treatment	According to the authorities minimal pollution of surface waters, partly remediated	
9	Zavod Kozitskogo, Vasileostrovsky distr.	Dumping area	1960's-1980's	1,3 Mt	17 ha	Closed	Illegal	-	-	MSW, industrial waste	10 m	No natural or artificial waterproof bottom. No leachate collection or treatment.	According to the authorities low risk because of long period after closing	
10	Petroslavyanka, Kolpinsky distr.	Dumping area	No data	~400 000	40 ha	Closed	Illegal	-	-	MSW, inert industrial waste	20 km/ 28 km (2,5 km from Neva)	No artificial waterproof bottom. Cambric clays (thickness is more than 10 m) under waste. Ground water is founded higher than clay. No leachate collection or treatment.	No data	

<sup>1</sup> 1 cub.m of waste for disposal = 0,2 t

<sup>2</sup> First number – is point to point distance, second number – is distance by river flow

## ANNEX Ib: LIST OF PRIORITY LANDFILLS AND DUMPS IN ST LENINGRAD

Pos. No.	Solid wastes dumpsite location	Dumpsite category	Year of dumpsite operation	Waste quantity (tons) (1m <sup>3</sup> = 0,8 tons)	Actual area	Active/Closed	Illegal/Managed	Annual volume of wastes disposal, m <sup>3</sup>	Hazardous waste content and type including origin and chemical composition	Water connection to Baltic Sea (yes/no). If yes, distance to Baltic Sea (km)	Risk reduction measures in use (e.g. bottom structure, seepage water collection etc.)	Risk characterization (risk to the Baltic Sea)	Monitoring practices
1	Landfill in Ivan-gorod (1 km to the South from Ivangorod)	Dump	1975	80 000	4,5 ha	Active	Managed	16 000		Narva – 1,2 km, Baltic Sea – 17km	No waterproof natural or artificial bottom. No leachate collection or treatment.	Old landfill, likelihood of presence of HW therefore high. Close to Narva industrial city. Location close to Narva River, leachate not collected, therefore a risk to Baltic Sea.	Monitoring carried out. Inspection once a year.
2	Landfill in Sosnoviy Bor town (0,5 km to the East from Sosnoviy Bor)	Dump	1968	362 000	10,2 ha	Active	Managed	100 000		Baltic Sea – 1,7 km	Cambric clays, but ground water level is high. No leachate collection or treatment.	Old landfill, likelihood of HW therefore high. GW level high and location close to Baltic Sea, therefore risk of leachate access to Baltic Sea high. No leachate collection.	Monitoring carried out. Inspection once a year
3	Landfill in Gatchina town, to North-East from Gatchina (Gatchinsky District)	Industrial waste landfill	1992	1 600 000	19,8 ha	Active	Managed	80 000	Waste of cardboard production (HW 3-5 class): paper, composition material, waste of equipment service, waste-water sludge	Ijora – 1km, the Baltic Sea – 31 km (from point to point), 90 km (by flow Ijora–Neva – Finnish Gulf)	No waterproof natural or artificial bottom. Leachate collection exists but there is no treatment. Landfill is completely full.	Landfill is large by area and overloaded (about 110%). No programme of restoring. High risk of fire. Industrial waste, possibly HW 1 to 3 class. No tight bottom, leachate collection and treatment not sufficient. Medium to high risk.	Air and water (ground and surface) are controlled. 3 holes exist around of landfill.
4	Solid waste landfill of Vyborg close to Tamisuo settl. (Vyborgski District)	MSW landfill	Licensed in 2006	200 000	4,5 ha	Active	Managed	170 800	Not known. Estimated at 19 300 m <sup>3</sup> /a1)	Viborgsky gulf – 1,5 km	No waterproof natural or artificial bottom. No leachate collection or treatment.	Close to Baltic Sea, no leachate collection. Medium risk	Regular monitoring Elevated concentration of Hg, Ni and oil in water.
5	Landfill in Gatchina settl., 300 m from Ivanovka settl., to the North-East from road junction Gatchina-Saint-Petersburg (Gatchinski District)	Dump	1965-2005	476 000	17,0 ha	Closed	Illegal	-	Not known. Estimated at 53 788 m <sup>3</sup> /a1)	Chanel 0,05 km, Izhora -1,2 km, Baltic Sea-38 km	No waterproof natural or artificial bottom. No leachate collection. Karst area.	Old landfill, likelihood of HW high, large area, no leachate collection. Medium risk	Inspection once a year Elevated concentration of Hg in water; elevated concentration o VOC in air.

1) Quantity of hazardous waste is estimated by Leningrad Oblast authorities based on annual waste volume disposed.



Pos. No.	Solid wastes dumpsite location	Dumpsite category	Year of dumpsite operation	Waste quantity tons (1m <sup>3</sup> = 0,8 tons)	Actual area	Active/Closed	Illegal/Managed	Annual volume of wastes disposal, m <sup>3</sup>	Hazardous waste quantity	Hazardous waste content and type including origin and chemical composition	Water connection to Baltic Sea (yes/no). If yes, distance to Baltic Sea (km)	Risk reduction measures in use (e.g. bottom structure, seepage water collection etc.)	Risk characterization (risk to the Baltic Sea)	Monitoring practices
6	Landfill in Kingisepp town, 2 km to the North from Kingisepp (Kingiseppski)	Dump	1978	336 000	14,0 ha	Active	Illegal	105 600	Not known. Estimated at 11 933 m <sup>3</sup> (a <sup>1</sup> )		Luga – 1,8 km, Baltic Sea – 33 km	Valdaiskie clays (5-10m), but high level of ground water. No leachate water collection or treatment.	Old landfill, no leachate collection, large area. Medium risk	Inspection once a year Elevated concentration of Hg, Cr, Zn and oil in water; elevated concentration of VOC in air.
7	Landfill in Viritsy (Gatchinsky district), 5 km to the west from Viritsy	MSW landfill	1986	100 000	5,0 ha	Active	Managed				Oredez – 5km	No waterproof natural or artificial bottom. Leachate collection is organized, no treatment.	Small landfill, leachate collection organized, no specific leachate treatment organized. Low risk	Regular monitoring of air and water.
8	Landfill in Kirovsk, 5 km along the road Kirovsk-Mga (Kirovski)	Dump	Since 1968	2 000 000	5,0 ha	Active	Illegal	45 000	Not known. Estimated at 5085 m <sup>3</sup> (a <sup>1</sup> )		Neva – 4,5 km, Baltic Sea – 50 km	Cambric clays, but high level of ground water. No leachate collection.	Old landfill, risk of HW present high. Large waste quantity. No leachate collection, high ground water level. Distance to Neva/Baltic Sea relatively high. Medium risk	Inspection once a year. Elevated concentration of Hg, Co, Cr, Cu, Ni, Zn, Pb and oil in water; elevated concentration of VOC in air
9	Landfill in v. Morozova (Vsevolozhsky district)	Dump	1998	212 000	1,0 ha	Closed	Managed	15 000			Neva – 1,5 km	Cambric clays, but high level of ground water. No leachate collection or treatment.	New landfill, small area, closed, high ground water level. No leachate collection, close to Neva. Low to medium risk.	Elevated concentration metals in soil; elevated concentration of VOC in air.
10	Landfill in Slantsy town, 400 m to the West from Pechurki settl. (Slantsevski District)	Dump	1972	80 000	5,0 ha	Active	Illegal	51 200 (calculated annual volumes)	Not known. Estimated at 5786 m <sup>3</sup> (a <sup>1</sup> )		r. Narva – 7,5 km, Baltic Sea – 29 km	No waterproof natural or artificial bottom. No leachate collection or treatment. High level of ground water	Old landfill, low waste quantity. Distance to river high. Medium risk	No data

1) Quantity of hazardous waste is estimated by Leningrad Oblast authorities based on annual waste volume disposed.

## ANNEX IC: LIST OF PRIORITY LANDFILLS AND DUMPS IN ST KALININGRAD REGION

Pos. No.	Solid wastes dumpsite location	Dumpsite category	Year of dumpsite operation start	Waste quantity tons (1m <sup>3</sup> = 0.8 tons)	Actual area	Active/Closed	Illegal/Managed	Annual volume of wastes disposal, m <sup>3</sup>	Hazardous waste quantity	Hazardous waste content and type including origin and chemical composition	Water connection to Baltic Sea (yes/no). If yes, distance to Baltic Sea (km)	Risk reduction measures in use (e.g. bottom structure, leachate collection etc.)	Risk characterization (risk to Baltic Sea)	Monitoring practices	Other information
1	LANDFILLS  Municipal dumpsite for solid wastes in Kosmodemyanovskogo town, located on the western outskirts of Kaliningrad	5	1978	22,3 M	18 ha	Active	Managed	900 000	No information available	Hazardous waste present in household waste	Potential connection. The landfill is located by the river with connection to Baltic Sea.	Rainwater and leachate water is collected in lagoon on top of the waste fill. No built bottom structures.	Contain household hazardous waste. Sensitive location by the River Prigolya with direct connection to Baltic Sea. Leachate collection and treatment under construction, but leachate collection not efficient because of lack of constructed bottom structure and the location next to a swamp and a river. High risk due to location and likely high HW quantity based on high total volume of waste and likely presence of HW.	Atmospheric air and soil. Air: (NO <sub>2</sub> , CO, Hg, SO <sub>2</sub> , H <sub>2</sub> S, NH <sub>4</sub> , NO) 4 times / year. (dust, soot, combustible gases) 2 times/year. Soil beyond the landfill fence: (pH, oil HCs, Cu, Zn, Ni, Pb, Cr + sanitary parameters) 4 times/year.	On the eastern side of the dumpsite the Pregolya river flows. The dumpsite is surrounded by forests of the 1st group. The dumpsite is located in a bogged area. There is an access road leading to the dumpsite. The site has a domestic zone and a main gate checkpoint. Wastes arriving to the dumpsite are visually controlled.
2	1.5 km from Kruglovo town up to motor road Kruglovo-Povarovka	5	1977	1,1 M	3.0 ha	Active	Managed	60 000	No information available	3rd hazard class waste are taken for disposal and hazardous waste present in household waste	Potential connection. A creek at 100 m distance, the creek flows to Primorska River which flows to the Baltic Sea	No built bottom structures. No efficient leachate collection. Leachate is occasionally pumped back to the top of the landfill.	Potential flow of leachate to the nearby River Primorska because there is no proper leachate collection. The LF takes hazard class 3 waste, used food oils and greases into two ponds located on top of the landfill. Before 1977 the LF was illegal, start-up year of operation is not known. Previously pyrolysis treatment of used tyres producing tar.	Surface water, atmospheric air and soil. Air: (CO) 4 times / year. Soil at sanitary prot. zone of LF in 4 points: (Pb, Cd, Cu, Zn, pH) 2 times/year. Water, well in Kruglovo village: (acid neutralization capacity, NH <sub>4</sub> , NO <sub>2</sub> , NO <sub>3</sub> -, Cl-, SO <sub>4</sub> -, hardness, solids, pH, Ca, alkalinity) 2 times/year. Stream in the sanit. prot zone, 3 points: (Odour, colour, solids, floating matter, pH, DO, BOD <sub>5</sub> , COD, Cl-, SO <sub>4</sub> -, NH <sub>4</sub> , NO <sub>2</sub> , NO <sub>3</sub> -, total Fe, Cu, Pb, alkalinity) 2 times/year.	The dumpsite is located in a forest in 300 m from motor road; it is not fenced nor ridged.

3	Marshal-skoye, area of the village Ilyichevka, Guryevsky municipal district.	5	1991	380 000	1,3 ha	Active	Managed	28 000	No information available	Hazardous waste present in household waste	Potential flow connection of leachate to the Bay Kurshskiy Zaliv (part of Baltic Sea).	No built bottom structures. No leachate collection.	As leachate is not collected, access of leachate to the Bay Kurshskiy Zaliv (part of Baltic Sea) cannot be excluded.	Groundwater, soil, atmospheric air. Atmospheric air at the personal service building of the LF: (NH4, H2S, CO, CH4, NO2, SO2) 4 times/year. Groundwater, 500 m from LF: (Mn, Cr, Cd, Cu, Pb, Zn, Ni, Hg, As) 2 times/year. Soil, 500 m from the LF: (Cd, Cu, Zn, Ni, Pb, As, pH, petroleum products + parasitology studies)	The dumpsite is fenced, controlled, access roads are available; the dumpsite is surrounded by pasture lands and is currently in use.
4	Baltiysk city, eastern outskirts	4	1992	24 000	3,0 ha	Closed	None		No information available	Hazardous waste present in household waste	Potential connection. Catchment area of Primorskaya bay of Kalinin-grad gulf. Less than 500 m from water body	No built bottom structures. No leachate collection.	Potential access of leachate to the Kaliningrad Gulf/ Primorsk Bay.	Closed in 1998, presently MSW transported to Kruglovo LF. No monitoring.	The dumpsite is not fenced. It is surrounded and thus limited by dacha plots and is not used. Reclamation is in progress. Border zone.
5	Gusev town, along the right side of motor road Gusev-Ozersk, 300 m	5	1984	600 000	3,8 ha	Active	Managed	42 000	No information available	Hazardous waste present in household waste	Potential connection. Western part of dumpsite with ponds is connected with water body and canals (catchment area of Pregolya river which flows to the Baltic Sea)	No leachate collection. No built bottom structures.	Untreated leachate from the landfill is drained to a pond and from there to a nearby creek and further to the river Prigolya which is located not far from the landfill. River Prigolya flows to the Baltic Sea.	Soil and atmospheric air. Air at the entry and at dumping area: (H2S, NH4, CO, CH4, benzene, CCl4) 4 times / year. Soil at the gate and at the dumpsite: (Cd, Cu, Zn, Ni, Pb, As, pH) once a year.	The dumpsite is not fenced, but ridged with embankment about 2 m high along the perimeter. Access roads (improved earth road) are available. To the north from the dumpsite there are lands belonging to Technical School no. 17; to the east there is pasture land and to the south and west there are reserve lands covered by trees, shrubs and bogs. The western edge of the dumpsite is adjoined by a pond connected to other water bodies by channel. Dominant winds blow from dumpsite towards the town.

6	Sovetsk city, ul. Mayakovskogo, within the city boundaries	5	1965	3.7 M	7.8 ha	Active	Managed	109 000	No information available	Hazardous waste present in household waste	Potential connection. Dumpsite is situated on steep slope towards to river, in catchment area of Neman river, less than 100 m.	No built bottom structures. No leachate collection.	Large landfill (second largest landfill in KO by size). Located in sloping terrain with high risk access of leachate to the nearby river because no leachate is collected and treated.	Atmospheric air, single study in 2007. Air, dumping site: (H2S, NH4, CO, benzene, formaldehyde, solid particles)	The dumpsite is situated near residential area, water bodies and in border zone. Residential houses are in 300 m from the dumpsite. The dumpsite is not fenced. The dumpsite is steeply inclined towards the Uzkaya river. Fires are very frequent at the dumpsite; it is currently in use.
7	Southward of Mamonovo town, on 1.6 km of motor road Mamonovo-Branevo, in 900 m from the road	5	1960	330 000	3.0 ha	Active	Managed	10 800	No information available	Hazardous waste present in household waste	Potential connection. In catchment area of Kaliningrad gulf	No built bottom structures, natural ground. No leachate collection.	Old landfill, therefore proportion of HWs likely higher than elsewhere. Close to Kaliningrad Bay and Baltic Sea. Close to Poland's border. Potential access of untreated leachate to Mamonovo River which flows to Baltic Sea.	Atmospheric air, surface water, soil. Atmospheric air: at the border of sanitary prot. zone: (NH4, H2S, benzene, CO, saturated hydrocarbons). Water, river Mamonovka: (odour, colour, pH, DO, BOD5, NO2-, NO3-, NH4) once a year. Soil, waste dump area: (hygienic indicator microbes) 3 times/year.	The dumpsite is situated in 500 m from gardening community Rassvet, in 800 m the Mamonovo's river flows to the north. The dumpsite is not fenced, it is controlled; access roads are available on the territory; the dumpsite is surrounded by shrubs and is currently in use. Border zone.
8	Chernyakhovsk town, ul. Chapayeva	5	1970	2.6 M	4.8 ha	Active	Managed	85 000	No information available	Hazardous waste present in household waste	Potential connection. In catchment area of Angrapa river and Pregolya river which flows to Baltic Sea.	No built bottom structures, natural ground. No leachate collection.	Large landfill, potential spread of untreated leachate to Angrapa River and further to Pregolya River which flows to Baltic Sea.	No monitoring.	The dumpsite is situated in 700 m from the town centre. Access road is available. It represents a large municipal dumpsite located on open terrain. The dumpsite has no visible impact on the environment and is currently in use.



9	Ladushkin town, southern outskirts of town, in the end of ul. Yesenina	5	No data	190 000	3,0 ha	Closed		10 000	No information available	Hazardous waste present in household waste	Potential connection. In catchment area of Kaliningrad gulf, distance less 1000m	No built bottom structures, natural ground. No leachate collection.	Situated close to Velejka River and at 1000 m distance from Kaliningrad Bay. Untreated leachate is a potential risk to the rivers and Kaliningrad Bay.	Closed in February 2009. No monitoring. Recultivation is programmed.	The dumpsite is situated in 100 m from the Velejka river and in 100 m from the urban residential buildings. The dumpsite is controlled, access roads are available.
10	Svetly town	5	No data	1,0 M	4,0 ha	Active	Managed	43 000	No information available	Hazardous waste present in household waste	Potential connection. In catchment area of Kaliningrad gulf, distance less 1000m	No built bottom structures. No leachate collection.	Distance to Kaliningrad Bay less than 1000 m, flow of untreated leachate is potential risk to the Baltic Sea.	Atmospheric air and soil. Atm. air at the border of san. prot. zone: (NO <sub>2</sub> , NO, CO, SO <sub>2</sub> , H <sub>2</sub> S, NH <sub>4</sub> , saturated hydro-carbons) twice a year. Soil at the LF area: (Cd, Cu, Zn, Cr, Ni, Pb, pH, petroleum products) twice a year.	
	OTHER SITES														
	Oil storage in port of Kaliningrad.								Estimated amount 19000 tons of oily soil.	In the port fuels are transferred from ships to railway cars and oily ballast waters are treated. Oil leaks during unloading, loading and storage operations.	Connection: located by the Baltic Sea.	Oil booms are needed to collect the seeping oil and to prevent its spread to the sea.	Immediate and visible risk to the Baltic Sea.		Soil of the port is heavily contaminated by oil which seeps all the time from the shore to the Baltic Sea.
	Sintez LTD, collection and demercurisation of Hg lamps								About 200 000 lamps are collected annually. Lamps are properly stored indoors.	Element Hg is separated and neutralized into Hg-S compounds.			Separate collection of lamps would reduce the quantity of mercury in landfill waste and therefore in leachate water and air emissions from the landfills.		Only about 40 % of all collected lamps are treated. More effective lamp collection would reduce access of mercury to the environment in household waste.

Waste quantities (Taxis 2003) have been updated, based on annual volumes, corresponding to situation at the end of year 2009.

## **ANNEX IIa: LIST OF PRIORITY LANDFILLS AND DUMPS IN LENINGRAD**

### **REFERENCE INDEX**

#### *STATIONARY FACILITIES FOR DISPOSAL OF CONSUMPTION AND PRODUCTION WASTE IN LENINGRAD REGION*

Landfills  
Industrial Waste Landfills  
Legal Dumps  
Illegal Dumps  
Dung And Manure Storage Facilities

## SLUDGE DISPOSAL FACILITIES

[illegible]

2.55		WWTP sludge grounds	0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	ND	Private WWTP – Recon- struction required	WWTP			
	Volkhov Town Municipality																
3.37		Sludge grounds – Sludge	3,00	65 200,0	0,00	0,00	0,00	0,00	0,00	0,00	1985	0	Permanent industrial WWTP in Volkhov town	Volkhov WWTP	Volkhov WWTP	1998	-
	Volkhov District																
4.36		Sludge grounds	0,01	0,00	0,00	0,00	0,00	0,00	0,00	150,0		ND		Unequipped	ND	1998	-
4.36		Sludge grounds	0,10	300,00	0,00	0,00	0,00	0,00	0,00	0,0	1965	ND	Equipped	Siasstroy WWTP	Industrial land	1998	-
4.37		Sludge grounds	0,10	120,00	0,00	0,00	0,00	0,00	0,00	0,0	1980	ND	Equipped	N.Ladoga WWTP	Private WWTP at N.Ladoga WWTP	1998	-
4.38		Sludge grounds	0,01	0,00	0,00	0,00	0,00	0,00	0,00	2 500,0	1982	ND	Private WWTP – Recon- struction is required	Aleksino WWTP	ND	1998	-
4.39		Sludge grounds	0,02	20,00	0,00	0,00	0,00	0,00	0,0	0,0	0	ND		Pasha KKP	ND	1998	-
4.40		Sludge grounds	0,02	0,00	0,00	0,00	0,00	0,00	0,0	0,0	1981	ND	Unequipped		ND	1998	-
4.41		Sludge grounds	0,00	0,00	0,00	0,00	0,00	0,00	0,0	0,0	1976	ND	Unequipped	Berazhki WWTP	ND	1998	-
4.41		Sludge grounds	0,01	0,00	0,00	0,00	0,00	0,00	0,0	0,0	1974	ND	Reconstruction is required	Novoladozhsky GPZ	íà	1998	-
4.43		Sludge grounds	0,01	0,00	0,00	0,00	0,00	0,00	0,00	100,00	1982	ND	ND	ND	ND	1998	-
4.46		Sludge grounds	0,00	0,00	0,00	0,00	0,00	0,00	0,00	15 000,0	1973	ND	Non operating	MKKP Khvalovo WWTP	MKKP Khvalovo WWTP	1998	-
4.47		Sludge grounds	0,10	0,00	0,00	0,00	0,00	0,00	0,00	1 500,0	1986	ND	Private, operating	OAO Avr.Kart.Fb.	Industry	1998	-
4.48		Sludge grounds	0,00	0,00	0,00	0,00	0,00	0,00	0,00	250,0		ND	Non operating, reconstruc- tion is required	Vyndin Ostrov WWTP	ND	1998	
	Vsevolozhsk District																
5.35		Sludge grounds	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00		ND	Unequipped	Rakhja WWTP	ND		
5.36		Sludge grounds, unequipped	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0	ND	Unequipped	ND	ND	2004	
5.39		Sludge cells	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,0		ND	Capacity exceeded, recon- struction is required	Koltushy WWTP	ND	2004	
5.38		Sludge grounds	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,0		ND	Reconstruction is required	ND	ND		
5.40		Sludge grounds	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,0		ND	Reconstruction is required	Steklianny WWTP	ND	2004	-
5.42		Sludge grounds, unequipped	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,0		ND	Reconstruction is required	ND	ND		
	Vyborg District																
6.36		Sludge grounds	0,00	5000,0	0,00	0,00	0,00	0,00	0,0	0,0	1967	ND		Pervomajskoye WWTP	ND	1998	-
6.37		Sludge grounds	0,00	40000,0	0,00	0,00	0,00	0,00	0,0	0,0	1967	ND		Pobeda WWTP	ND	1998	-
6.39		Sludge grounds	0,00	20000,0	0,00	0,00	0,00	0,00	0,0	0,0	1980	ND	Permanent, associated with process	AO Altair	ND	1998	-



6.40	Sludge grounds	0,10	0,00	50,0	0,0		ND	Operating, reconstruction is required	Korobitsyno WWTP	ND	1998	-
6.41	Sludge grounds	0,00	40000,0	0,00	0,0	1987	ND	Permanent, military	Kamenka Military department	ND	1998	
6.42	Sludge grounds	6,90	14000,0	0,00	0,0	1990	ND	Overloaded	Sosnovy WWTP	ND	1998	
6.44	Sludge grounds, equipped	0,25	0,00	30,00	0,0		ND	Operating	Losevo WWTP	ND	1998	
6.45	Sludge grounds	0,00	10000,0	0,00	0,0	1978	ND	Permanent, operating	Leninskoye WWTP	ND	1998	
6.47	Sludge grounds - MSW	0,00	20000,0	0,00	0,0	1976	ND	Permanent, operating	Semizorje WWTP	ND	1998	-
Gatchina District												
8.39	Sludge grounds	0,00	0,00	0,0	50000,0	1970	ND	ND		ND	1998	-
8.41	Sludge grounds	0,00	0,00	0,0	0,00		ND	Permanent, reconstruction is required	ND	ND	2004	-
8.38	Sludge grounds	1,20	48000,0	0,00	46000,0	1985	ND	Permanent, reconstruction is required	Gatchina WWTP	ND	1998	-
Kingisepp District												
10.36	Sludge cells	100,20	0,00	0,00	95,0	1974		Permanent, equipped	MUE Vodokanal	ND	2004	
Kirishy District												
11.38	Sludge grounds - WTP	1,00	0,00	0,00	0,00	1974	ND	Industrial	Glazhevo WWTP	ND	1998	-
11.39	Sludge grounds	1,00	0,00	0,00	0,00	1974	ND	ND	Bugodosch	ND	1998	-
11.36	Sludge grounds	1,00	0,00	0,00	0,00	1975	ND	ND	Kusino kKP	ND	1998	-
11.37	Sludge grounds - Sludge	10,00	0,00	0,00	0,00	1980	ND	Permanent, industrial, private	Ptchevzha WWTP	ND	1998	
11.32	Sludge grounds - Sludge	20,00	0,00	0,00	0,00		ND		AO KINEF	ND	1998	-
Kirovsk District												
12.11	WWTP sludge grounds	0,10	0,00	0,00	1 400,0	1979	ND	ND	ND	ND	1998	
12.35	WWTP sludge grounds	0,10	0,00	0,00	1 400,0	1974	ND	Permanent private	Putilovo WWTP	ND	1998	-
12.37	Sludge cell, equipped	0,00	0,00	0,00	0,0	1984	ND	Permanent, industrial	Siniavino WWTP	Leningrad Region Resolution 114-27_04.7	1998	
12.38	Sludge cells	0,20	0,00	0,00	0,0	1970	ND	Permanent, overloaded	Korovsk WWTP	Leningrad Region Resolution 114-27_04.7	1998	-
12.39	Sludge grounds	0,10	0,00	0,00	0,0	1990	ND	ND	Nazia WWTP	ND	1998	-
12.41	Sludge grounds	0,50	0,00	0,00	0,0	1984	ND	Unequipped	Maluksa WWTP	ND	1998	-
12.42	WWTP sludge grounds	0,00	0,00	0,00	0,00	1970	ND	Non-operational	Shum WWTP	ND	1998	-
12.44	Sludge grounds, equipped	0,00	0,00	0,00	0,00	1974	ND	Permanent, reconstruction is required	Pavlovo WWTP	Leningrad Region Resolution 114-27_04.7	1998	-
12.45	Sludge grounds WTP	0,00	0,00	0,00	0,00	1968	ND	Non-operational, reconstruction is required	Otradnoye WWTP	Leningrad Region Resolution 114-27_04.7	1998	
Lomonosov District												



21.35	Sludge grounds	0,00	0,0	0,0	0,0	0,0	0,0	0,0	-	-	Podporozhje WWTP		1998	
21.39	Sludge grounds	0,00	0,0	0,00	0,0	0,0	0,0	0,0	-	-	Wazhyna WWTP		1998	
Prizhorsk District														
22.35	Sludge grounds	0,0	0,0	0,00	0,0	0,0	0,0	0,0	0,00	ND	Reconstruction is required	ND	1998	-
22.36	Sludge grounds	0,0	0,0	163,0	0,0	0,0	0,0	0,0	1987	ND	ND	Prizhorsk WWTP	1998	-
22.37	Sludge grounds	0,0	0,0	0,00	0,0	0,0	0,0	0,0	1988	ND	Permanent, reconstruction is required	Sosnovy WWTP	1998	-
22.42	Sludge grounds	0,0	0,0	12,0	0,0	0,0	0,0	0,0	1979	ND	ND	ND	1998	-
22.49	Sludge grounds - MSW	0,0	0,0	35,0	0,0	0,0	0,0	0,0	1979	ND	Reconstruction is required	Kuznetchnoye WWTP	1998	-
Slantsy District														
25.36	Sludge grounds	0,0	0,0	0,0	0,0	0,0	0,0	0,0	1962	ND	Private, equipped	Slantsy WWTP	1998	-
Sosnovy Bor Town Municipality														
26.39	Sludge grounds	0,60	1 500,0	12,0	1 310,0	1976	ND	ND	ND	ND	Municipal Service SMUE	ND	1998	-
26.41	Sludge grounds	0,69	3 500,0	74,0	5 490,0	1984	ND	ND	ND	ND	Municipal Service SMUE, Sosnovy Bor	ND	2004	-
Tikhvin District														
27.36	Sludge grounds	5,4	0,0	0,0	141,0	ND	ND	ND	ND	ND	MUE Vodokanal of Tikhvin town	ND	2004	-
27.37	Sludge cells - Tank	0,0	0,0	0,0	0,0	1995	ND	ND	ND	ND	ND	ND	2004	-
27.39	Sludge grounds	0,0	0,0	0,0	0,0	ND	ND	ND	ND	ND	ND	ND		
27.42	Sludge grounds	0,0	0,0	0,0	0,0	ND	ND	ND	ND	ND	ND	ND		
27.48	WWTP sludge grounds	0,0	0,0	0,0	0,0	ND	ND	ND	ND	ND	Permanent, reconstruction is required	Pashozero WWTP	1998	-

## Landfills

Municipality, District / Code	Type	Area, ha	Capacity, ton	Capacity	Accumulated, ton	Commissioning	Colo- sure	Status/condition	Operating authority	Land use	Inven- tory audit	Cor- rec- tion
Volkhov Town Municipality												
3.2	Solid waste landfill	0,00	0,00	0,00	0,00			ааа.йййг.	AO VAZ	Industrial land	2004	
Vsevolozhsk District												
5.1	Solid waste landfill	60,00	0,0	0,00	4120000,0	1970		Approved, equipped	ZAO Promothody, MPBO-1	ND	2004	
5.2	MSW landfill	60,00	0,0	40 000,0	6550,0	1974	2013	ND	SUE MPBO-2	ND	2004	
5.4	MSW landfill	10,00	0,0	66 000,0	344330,0	1998	ND	ND	OOO MSW Landfill	Resolution 1274_07.99	2004	
5.6	MSW landfill	0,00	0,0	0,0	0,00	2004	2018	Permanent, equipped	ZAO Vuoly-EKO	2004		
5.18	MSW landfill	1,00	0,0	0,00	212000,0	1998	ND	Temporary, unequipped, Morozov village	OOO Rostechmocomplex	Industrial 2004	1998	2004
Vyborg District												
6.2	Solid waste landfill	2,27	150,0	0,0	0,00	1986	ND	Permanent, industrial waste storage	SE Vodokanal	ND	1998	
6.3	MSW landfill	17,00	0,0	7600,0	0,00	1965	ND	Primorsk Town landfill, recultivation	MUE Primorsky KPP	Land use resolution .38-04.65	1998	2004
6.5	Solid and MSW landfill	3,20	390,0	0,00	0,00	1984	ND	Permanent, private, Vyborg RZD, recultivation.	OA Ruberoid Plant	ND	1998	-
6.6	Solid waste landfill	3,60	0,0	0,00	0,00	1983	ND	Permanent, industrial	AO Aksolim	ND	1998	-
6.10	Solid waste landfill	2,20	0,0	159,0	0,00	1992	ND	Permanent, private	AO Miasokombinat	ND	1998	-
Gatchina District												
8.01	MSW landfill	0,00	901275,0	0,0	115200,0	1999	ND	Permanent, operational, equipped	OOO Novy Svet EKO, license.47MU130088Л until 10.08.	Administrative resolution	2004	-
8.05	Solid waste landfill	0,00	2400000,0	48870,0	380216,0	1980	ND	Private, permanent	OOO SJP Cardboard and Poly-graphic Combine, license until 05.07	Private	2004	-
Kingisepp District												
10.02	Equipped landfill, private	0,00	0,00	0,00	7500,0	1997	ND	Private	OOO Eurochem, license ¾ until 12.07	Private	2004	-
Kirishy District												
11.1	MSW landfill	0,00	0,00	7000,0	0,00	1965	2005	Permanent, closure is required	Kirishy Town Administration	Kirishy Town	1998	
11.02	Construction and demolition waste landfill	0,00	0,00	0,00	0,00	НД	ND	Private landfill, GRES 19	License until 07.05.09			
11.04	Solid waste landfill	0,00	0,00	0,00	0,00			Private	License until 26.03.09		2004	-





# INDUSTRIAL WASTE LANDFILLS

Municipality, district / Code	Type	Area, ha	Capacity, ton	Capacity, ton/yr	Accumulated, ton	Commissioning	Closure	Status / condition	Operator	Land use / documents	Inventory audit	Correction
Boksitogorsk District												
1.82	Sludge collector	0,00	0,00	0,00	160000,0	1970	ND	Permanent, private	AO Ginozev	Land of Pikalevo Town	1998	2004
1.81	Sludge dump	499,90	0,00	0,00	0,0	1969	ND	Permanent, private	AO Ginozev	Industrial land	1998	-
Volkhov Town Municipality										Industrial land		
3.81	Gypsum depositary	104,00	0,00	0,00	0,0	1970	ND	Permanent, private, department 2	AO VAZ	ND	2004	-
3.82	Gypsum depositary	50,00	15 000,0	0,00	0,0	1980	ND	Permanent, industrial, recultivation is required	AO VAZ	ZAO VAZ	2004	-
3.83	Gypsum depositary	2,50	80,00	0,00	58000,0	1964	ND	Permanent, industrial	ZAO VAZ	ZAO VAZ	2004	-
3.85	Sludge depositary	0,00	0,00	0,00	0,0	ND	ND	ND			2004	-
Volkhov District												
4.62	Sludge collector	0,00	0,00	0,00	0,0	ND	ND	ND		ND	2004	-
4.61	Sludge disposal field	0,00	0,00	0,00	0,0	ND	ND	Sludge disposal field, industrial	0	ND		
Kingisepp District												
10.81	Slime thickener	0,00	0,00	0,00	0		ND			ND		
10.83	Sludge disposal field		0,00	0,00	0,00	0				ND		
10.82	Tailings disposal field	43,84	0,00	0,00	0,0	1980	ND	Permanent, private, industrial	MHK Eurochem	Industrial land	1998	-
Kirishy District												
11.82	Slime thickener	300,000	0,00	0,00		1996	ND	Permanent, industrial	AO KNOS	Industrial land	1998	-
Kirovsk District												
12.81	Ash-and-slug collection field	32,00	0,00	0,00	0,0	1936	ND	0	AO GRES 19		2004	-
Pikalevo Town Municipality							ND					
20.81	Sludge collector	0,00	0,00	0,00	160000,	1970	ND	ND		ND	1998	-
Slantsy District												
25.82	Slime thickener	0,0	0,00	0,00	0,0	1976	2010	0	AO Slantsy	Industrial land	1998	-
25.87	-	0,0	0,00	0,00								
25.81	Slime thickener	409,00	0,00	0,00		1968	ND	AO Slantsy	AO Slantsy	Industrial land	1998	-
Tikhvin District												
27.81	Industrial waste dump	28	0,0	1075500,0		1982	ND	Private	TRANSMACH	Industrial land	1998	-
27.37	Sludge dump	96,0	0,0	0,0	0,00			Private, equipped	OAO TRANSMACH	Industrial site	1998	-

## LEGAL DUMPS

Municipality, district / Code	Type	Area, ha	Capacity, ton	Capacity, ton/yr	Accumulated, ton	Commissioned	Closed	Status / condition	Operator	Land use	Inventory audit	Correction
Boksitogorsk District												
1.4	MSW Dump	10,00	0,00	0,00	1600,0	ND	2008	Dump of B.Dvor village, reconstruction is required	None	B.Dvor Village Administration	2004	-
1.5	MSW Dump	4,00	0,00	0,00	2000,0	ND		Pikalevo dump	Pikalevo MKKP	Pikalevo Town Administration	2004	
1.11	MSW Dump	5,00	709 232,0	16 930,0	624719,0	1965		Permanent, equipped	MUE Boksitocoomkhoz	1998	2004	-
Volosovo District											-	
2.3	MSW Dump	1,00	8000,0	275,0	3200,0	1994	2012	Private dump of ZAO Torosovo	ZAO Torosovo	Resolution 252_05.94	2004	-
2.4	MSW Dump	1,45	11861,0	398,0	4000,0	1993	ND	Permanent dump of Seltso village	ZAO Seltso	Resolution 355_06.94	1998	2004
2.8	MSW Dump	1,00	8000,0	0,00	1300,0	-	ND	Dump of Damoshkovichi village	Municipal Service Enterprise of Volosovo District Municipality	Lease for 12 years	-	2004
2.9	MSW Dump	0,00	16000,0	750,00	400,0	1996	ND	Dump of Raglitsy village	Municipal Service Enterprise of Volosovo District Municipality	Lease_4608_03.0	2004	-
2.10	MSW Dump	0,50	4000,0	225,0	3000,0	1989	ND	Permanent, Beseda village	BSHT	Resolution MO_175_AP_4604_	1998	2004
2.11	MSW Dump	1,00	9000,0	0,00	1000,0	1998	ND	Permanent dump of Kursk village	Municipal Service Enterprise of Volosovo District Municipality	Lease, resolution 466	2004	-
2.12	MSW and industrial waste Dump	4,30	0,0	0,0	210,0	lä	2004	Permanent, unequipped	None	ND	1998	-
2.17	MSW and industrial waste dump	1,00	8180,0	275,0	2000,0	1993	2009	Permanent	AOZT Leninsky Put	Municipal resolution 209_05.99	1998	2004
2.19	MSW Dump	5,00	0,00	4255,0	85100,0	1993	2005	Temporary	Municipal Service Enterprise of Volosovo District Municipality	1998	2004	-
Volkhov Tosn Municipality												
3.1	MSW Dump	4,60	193200,0	42000,0	436450,0	1975	2021	Permanent dump of Volkhov town, equipped	OOO Saneko	Resolution MO48_04.02_AP_10	1998	2004
Volkhov District												
4.1	MSW Dump	18,00	0,0	0,0	1500000,	1974	2021	Permanent, equipped	Siasstroy town	Municipal land	1998	-
4.05	MSW Dump	2,00	2000,0	12,0	0,0	1956	ND	ND		ND	1998	-
4.8	MSW and industrial waste dump	6,50	100000,0	0,00	132000,0	1956	ND	Temporary dump of N.Ladoga town, recultivation	MUE KKP N.Ladozhsky	ND	1998	2004
4.9	Industrial waste dump	0,50	0,0	20,00	0,0			Private, equipped	Avrov. Cardboard fabrique	Industrial site	1998	-
Vyborg District												

6.1	MSW and industrial waste dump	5,70		110000,0	0,00	0,00		1978	ND	Town dump, reconstruction is required	Administration, OOO Resem	ND	1998	2004
6.04	MSW and industrial waste landfill, equipped	3,00		5100,0	0,0	0,0		1990	2006	Private, equipped	AO Vyborg Paper Mill	ND	1998	0
6.8	MSW and industrial waste dump	1,50		0,0	7,20	0,0		1989	ND	ND	AOOT Lesogorsk Plant	Land allocation act	1998	2004
6.09	MSW Dump	0,00		0,00	0,0	0,0		2002	ND	ND	MUE Krasnod.KPP		2004	
6.11	MSW Dump	2,30		8000,0	0,0	0,0		1987	ND	City landfill, reconstruction is required	MUE Borod.Multifunctional Enterprise	MUE Borod. Multifunctional Enterprise	1998	-
6.11	MSW Dump	35,00		15,80	0,0	0,0		1978	ND	Permanent, equipped	Aroschino Village Administration	ND	1998	
6.15	MSW Dump	6,00		0,00	0,00	1200000,0		1972	ND	Not approved, permanent, Vyborg	Vyborg City	None	1998	2004
Gatchina Town Municipality								0						
7.1	MSW Dump	0,00		0,00	0,00	0,0		ND		Gatchina dump, closure required	Municipal Service Enterprise Spetsavtobaza of Gatchina	ND	2004	-
Gatchina District								ND						
8.1	MSW Dump	5,00		0,00	18700,0	90500,0		1986	ND	Permanent, Vyritsa village	OOO Economonitoring	Resolution 1748-08.02	1998	2004
8.2		0,00		0,00	0,00	0,0		1985	ND	ND	Municipal Service Department of Gatchina Town Municipality	Resolution 390-08.94	2004	-
8.25	MSW Dump	10,00		0,00	0,00	0,00		1960	ND	Permanent dump of Gatchina town until 1979, recultivation	None	ND	1998	-
Ivangorod Town Municipality														
9.1	MSW Dump	3,80		0,00	0,00	48500,0		1975	2005	Temporary dump of Ivangorod town	Ivangorod Municipal Service Enterprise	Decree 14-p 01.97	1998	2004
Kingisepp District								0						
10.1	MSW Dump	16,20		17650,0	16 900,0	147465,0		1978	ND	Ligal permanent dump of Kingisepp town	Kingisepp Municipal Service Enterprise	Resolution 294-07.78	2004	-
10.2	MSW Dump	1,20		28000,0	650,0	6500,0		1991	2013	Permanent legal dump of Korpovo village	Municipal Service Enterprise	Certificate 189-IT-01.92	2004	-
10.3	MSW Dump	0,45		3800,0	272,0	1500,0		1995	ND	Permanent equipped dump of Falilevo village	Municipal Service Enterprise	Certificate 158-+03.96	1998	2004
10.7	MSW Dump	0,55		0,00	120,00	1250,0		1998	ND	Leggal dump of Logi village	RK Baltika	Decree 1235-6-11.98	2004	-
10.8	MSW Dump	2,50		0,00	0,00	10500,0		1997	2031	Permanent departmenta dump Fosforit	MKH Eurochem	Resolution 705-09.03	2004	-
10.11	MSW and industrial waste dump	2,40		0,00	0,00	0,0		ND	ND	Permanent private dump	Ust-Luga RK	None	1998	
10.15	MSW Dump	1,20		0,00	200,00	0,0		ND	2009	Temporary, unequipped	Municipal Service Enterprise	None	1998	2004
Kirishy District														
11.2	MSW Dump				350,0	0,0		1995	ND	Permanent dump of Budogosh village, closure required	MP KPP Budogosh	Decree 1955-12.03	2004	-



11.05	MSW Dump					0,0	0,0	ND	ND	Permanent, equipped	OOO Lel'	License 47/04006/п/4 until 06.09 1211/03	2004	-
Kirovsk District														
12.1	MSW Dump	5,00				0,0	385000,0	1981	ND	MSW dump of Kirovsk town, recultivation is required	MUE Kirovsk Gorzhylyomkhoz	Certificate 83_02.96	2004	-
Kommunar Town														
14.2	Industrial landfill					45 000,0		1965	Closed	None	ND		1998	-
Lodejnoye Pole District														
16.8	MSW Dump	2,30						1950	ND	Permanent, recultivation is required	MUE KBH of Lodejnone Pole	None	2004	-
Luga District														
18.5	MSW Dump	1,00		1 400,00	0,00	2,90		1982	ND	Temporary, unequipped	None	ND	1998	-
Podporozhje District														
21.01	MSW Dump	1,50		0,00	4 700,00	29000,0		1988	ND	Permanent equipped dump of Podporozhje Village	MP Rajzhylyomkhoz	Resolution 597-11.88	2004	-
21.06	MSW Dump	3,00		0,00	112,00	680,0		1995	2015	Permanent MSW dump of Vazhino	Municipal Service Enterprise	Administrative resolution 942-07.95	1998	
21.4	MSW Dump	3,00		0,00	33,00	430,0		1997	2010	Permanent dump of Voznesenije village, equipped.	Municipal Service Enterprise	Resolution BO 1-01.97	2004	
Prizorskiy District								0						
22.1	MSW Dump	0,00		0,00	0,0	0,0		ND	ND	Permanent dump of Sevashjanovo village, equipped	Prizorskiy Municipal Service Enterprise	Resolution 1150-09.03	2004	
22.4	MSW Dump	0,00		31 000,0	0,0	0,0		1984	ND	Permanent dump of Prizorskiy town	MUE Ecologia	Administrative resolution 1150-09.03	1998	2004
22.05	MSW Dump	0,00		0,00	0,0	0,0		1998	ND	Permanent dump of Vinitsa village	Vinitsa Village Administration	Resolution 289-06.88	2004	-
22.7	MSW Dump	0,00		1 125,0	0,0	0,0		1976	ND	Permanent dump of Sosnovo village	MUE KBH	Administrative resolution 1150-09.03	1998	2004
22.10	MSW Dump	0,80		0,00	100,0	0,0		1981	ND	Permanent dump of Romashka village	Prizorskiy Municipal Service Enterprise	Administrative resolution 1150-09.03	1998	2004
22.12	MSW Dump	0,00		0,00	0,0	0,00		ND	ND	Permanent dump of Gromovo village	Gromovo Village Administration	Administrative resolution 1150-09.03	2004	-
Svetogorskiy Municipality														
23.1	MSW Dump	1,60		0,0	900,0	0,0		1977	ND	Permanent, equipped	AO SVIATOGORSK		2004	
23.2	MSW Dump	5,00		280000,0	24064,0	23127,0		1988	ND	Permanent, equipped	Sviatogorskiy City			
Slantskiy District														

25.1	MSW Dump	5,0	0,0	12 500,0	90000,0	1972	2005	Slantsy town landfill, recultivation is required	MP "City Amenity Combine"	None	1998	2004
210												
Sosnovy Bor Town Municipality												
26.01	Permanent MSW dump, equipped	10,2	60200,0	25200,0	362000,2	1968	2008	Dump of Sosnovy Bor town reconstruction is required	Municipal Service Enterprise of Sosnovy Bor	Resolution of Municipal Administration 187_97 cb_292	2004	-
Tikhvin District												
27.01	MSW Dump	12,6	0,0	3000,0	59200,0	1989	2018	Dump of Tikhvin town, reconstruction is required	MUE "Blagoustrojstvo"	Certificate 673_07_93	1998	2004
Tosno District												
28.6	Former Ust-Tosno Landfill, closed	0,0	0,0	0,0		1970	1990	-	-	-	2004	-

## ILLEGAL DUMPS

Municipality, district / Code	Type	Area, ha	Capacity, ton	Capacity, ton/yr	Accumulated, ton	Commissioning	Closure	Status / condition	Operator	Land use / license	Inventory audit	Correction
Boksitogorsk District												
1.9	MSW dump	0,00	0,0	0,0	0,00	ND		Temporary, unequipped		None	1998	-
1.12	MSW dump	1,00	7500,0	0,0	1200,00	1973		Temporary dump of Anisimovo village	None	ND	1998	2004
1.13	MSW dump	2,00	0,0	0,00	1200,0	ND	ND	Temporary dump of Mozolevo village, reconstruction is required	None	None	1998	
1.16	MSW dump	3,22	30000,0	1200,0	13000,0	1970	ND	Temporary dump of Efimovsky village, reconstruction is required	MUE Efimovzhilcomkhoz	None	1998	2004
Volosovo District												
2.2	MSW dump	0,00	8000,0	275,00	1800,0	1995	ND	Temporary dump of Gomontovo begunitsy	ZAO Gomontovo	Resolution MO 54_03.95	2004	-
2.4.	MSW dump	1,00	8000,0	275,0	1600,0	1994	2008	Private dump of Sumino village, unequipped	ZAO Sumino	Resolution 252_05.94	2004	-
2.5	MSW dump	1,10	9000, 0	302,0	6400,	1995	2005	Private dump, closure required	ZAO Octabrskoye	Resolution MO 107_03.95	2004	-
2.06	MSW dump	0,40	4000,0	250,0	1000,0	1989	ND	Temporary, private	Vsevolozhsk District Municipal Service Enterprise	Ar_4602_03.02.20 ne	2004	
2.6	MSW dump	2,00	0,00	0,00	0,0	1991	ND	Temporary, private	AOZT Sumino		1998	-
2.7	MSW dump	2,21	0,00	0,00	0,00	ND	Nd	Permanent unequipped dump of Ushevititsy village	AOZT Ushevititsy	ND	1998	-

2.12	MSW dump	1,50	0,00	0,00	0,0	1993	2009	Temporary	MIS Kalitino	None	1998
2.13	MSW dump	1,50	0,00	0,00	0,00	ND	2005	Temporary dump of Gomontovo village, recultivation is required	AOZT Gomontovo		1998
2.14	MSW dump	1,00	8 180,0	275,00	2900,0	1999	ND	Temporary dump of Klopitsy village	ZAO OPZ	ND	2004
2.15	MSW dump	0,75	6 135,0	275,00	2000,0	1998	ND	Temporary dump of Zimnitsy village, reconstruction is required	ZAO Trud	Resolution MO 250_05.98	2004
2.18	MSW dump	6,60	120 000,0	0,00	48000,0	1993	0	Temporary dump, recultivation is required	Municipal Service Enterprise	Administrative resolution 93_42	1998
2.20	MSW dump	2,00	14,0	0,00	0,0	1980	0	-			1998
2.21	MSW dump	0,43	0,00	0,00	0,0	1993	2005	Permanent, private	AOZT Rabitsy	Land of AOZT Rabitsy	0
2.23	MSW dump	2,30	0,00	0,00	0,0	1991	0	Permanent private dump	ZAO Siaglitsy	Land of ZAO Siaglitsy	1998
2.24	MSW dump	1,00	8 180,0	275,00	2000,0	1995	2006	Private dump of Siaglitsy, Bol.Vruda	ZAO Siaglitsy	Resolution 292 05.99	2004
2.26	MSW dump	1,00	8 180,0	275,00	2000,0	1995	ND	Permanent dump of Izvara village	ZAO Udarnik	Resolution MO 481_06.96	2004
2.27	MSW dump	6,60	0,00	0,00	0,0	1991	ND	Temporary private dump	AOZT Ostrovitsy	None	1998
Volkhov District											
	MSW dump	0,00	0,0	0,0	0,0	ND	ND	ND	MUE KBH	ND	2004
	MSW dump	3,00	0,0	0,0	0,0	1998	ND	ND	None	ND	1998
	MSW dump	0,10	0,0	0,0	0,0	ND	ND	Aleksino village, reconstruction is required	None	None	2004
	MSW dump	0,10	0,0	0,0	0,0	ND	ND	Temporary	None	None	2004
	MSW dump	0,00	0,0	0,00	0,00	ND	ND	Temporary, unequipped	None	None	1998
	MSW dump	0,10	0,0	0,0	0,0	ND	ND	Temporary	None	ND	1998
4.27	MSW dump	0,20	0,0	0,0	0,0	1996	ND	None	None	ND	1998
4.28	MSW dump, equipped	12,00	0,0	0,0	0,0	1997	ND	Temporary dump of Berazhki village	None	None	2004
Vyborg District											
6.12	MSW dump	0,00	40,00	0,00	0,00	1980	ND	Permanent dump of Pervomajskoye village	Pervomajskoye Village Administration	ND	1998
Gatchina District											
8.3	MSW dump	0,07	0,00	0,00	100,00	1998	ND	ND	None	DRSU land	2004
8.5	MSW dump	0,15	0,00	0,00	250,0	ND	ND	Temporary	Orlinskaya Volost Administration	0	2004
8.6	MSW dump	0,10	0,00	0,00	45,0	ND	ND	ND	None	DRSU land	2004

8.8	MSW dump	0,01		0,00	0,00	300,0	1998	ND	Temporary dump of Novinka village	None	Novinka Volost Administration	2004	-
8.10	MSW dump	1,00		0,00	0,00	200,0	1998	ND	Temporary dump of Pudost village	None	Land of Pudost Volost Administration	2004	-
8.11	MSW dump	0,15		0,00	0,00	200,0	2000	ND	Permanent dump of Tajtsy village	None	Land of Tajtsy village	2004	-
8.13	MSW dump	0,40		0,00	0,00	650,0	ND	ND	Dump of Pitkalevo village, recultivation is required	None	Land of SPK Plamia	2004	-
8.15	MSW dump	0,15		0,00	0,00	4500,0	ND	ND	Temporary dump of Semirino village, recultivation is required	None	None, land of Orlinsk VO	2004	-
8.16	MSW dump	1,00		0,00	0,00	230,0	ND	ND	Dump of Vyritsa village, recultivation is required	Vyritsa Village Administration	Land of Vyritsa Village	2004	-
8.17	MSW dump	1,00		0,00	0,00	150,0	ND	ND	Temporary dump of Vyritsa village	Vyritsa Village Administration	Land of Vyritsa Village	2004	-
8.18	MSW dump	0,15		0,00	0,00	100,0	ND	ND	Temporary dump of Kartashevskaya village	None	Land of Kartashevskaya Village	2004	-
8.21	MSW dump	0,05		0,00	0,00	120,0	ND	ND	Temporary dump of DRSU	None	DRSU	1998	2004
8.26	MSW dump	0,00		0,00	0,00	0,0	ND	ND	ND			1998	-
8.40	MSW dump	0,55		0,00	0,00	100,0	1996	ND	ND	None	Druzhnaya Gorka Village Administration	1998	2004
Kingisepp District													
	MSW dump	0,00		400,0	0,0	0,00	ND	ND	ND	AOZT Opolje	ND	1998	-
	MSW dump	0,00		0,00	0,00	0,00	ND	ND	ND	Municipal Service Enterprise	Resolution 231-03.98	2004	-
10.6	MSW dump	0,50		0,00	225,0	1000,0	1997	0	Permanent dump of Kuzemkino village	Municipal Service Enterprise	ND	2004	-
10.16	MSW dump	1,20		0,00	0,00	0,00	ND	ND	Permanent private dump, Kotly village	AOZT Kotel'skoye	None	1998	-
Kirishy District								0					
	MSW dump	0,02		0,00	0,00	80,0	ND		Permanent, unequipped	MP KKP Budogosh	Public land reserve	2004	-
	MSW dump	0,10		0,00	0,00	75,0	ND		Permanent	OOO Lei	Public land reserve	2004	-
	MSW dump	0,15		0,00	0,00	0,0	ND	0	Permanent	OOO Lei'	Public land reserve	2004	-
11.3	MSW dump	0,40		0,00	0,00	800,0	ND	0	Permanent	OOO Lei'	Public land reserve	2004	-
Kirovsk District													
	MSW dump	2,00		0,00	0,00	0,0	1970	ND	ND	Nazia Municipal Service Enterprise	Land of Nazia village	2004	-
	MSW dump	3,50		0,00	0,00	0,0	ND	ND	Dump of Putilovo village	None	Land of VO Priladozhskoye	2004	-
12.6	MSW dump	4,50		0,00	0,00	0,0	ND	ND	Permanent dump of Shum village	None	None	1998	2004

Kommunar Town	MSW dump	0,26				0,00	0,00	0,00	42000,0	1964	1991	Closed. OAO BF Kommunar	Land of Kommunar Town Municipality			
14,																2004
Lodejnojye Pole District																
16.2	MSW dump	0,00	0,00	0,00	0,0	0,00	0,00	0,00	0,0	2001	2005	Temporary	MUE Elekhovschina KKP	Decree 549-05.01.		2004
16.4	MSW dump	0,00	0,00	0,00	0,0	0,00	0,00	0,00	0,0	2001	2005	Temporary	MUE KKP Rassvet	Decree 549-05.01.		1998
16.6	MSW dump	0,00	0,00	0,00	0,0	0,00	0,00	0,00	0,0	ND	2005	Temporary	MUE KKP Rassvet	Decree 549-05.01		2004
16.5	MSW dump	0,00	0,00	0,00	0,0	0,00	0,00	0,00	0,0	2001	2005	Temporary dump, closure is required	Svirstroy Village Administration	Decree 549-05.01		2004
16.3	MSW dump	0,00	0,00	0,00	0,0	0,00	0,00	0,00	0,0	2000	-	Temporary, unequipped	MUE Alekhovschina KKP	Decree 482-12.00		2004
Lomonosov District																
17.22	MSW dump	1,20	0,00	0,00	140,0	0,00	0,00	0,00	0	ND	ND	Permanent, unequipped	None	None		1998
17.23	MSW dump	1,00	0,00	0,00	0,0	25,00	0,00	0,00	0,0	ND	ND	ND	None	None		2004
17.24	MSW dump	0,50	0,00	0,00	50,0	0,00	0,00	0,00	ND	ND	ND	ND	None	None		2004
17.25	MSW dump	0,50	0,00	0,00	70,0	0,00	0,00	0,00	ND	ND	ND	ND	None	None		2004
17.27	MSW dump	0,50	0,00	0,00	0,0	70,00	0,00	0,00	ND	ND	ND	ND	None	None		2004
Luga District																
18.04	MSW dump	0,00	0,00	0,00	0,0	0,00	0,00	0,00	1980	ND	ND	ND, admin.	ND			2004
18.6	MSW dump	1,00	0,00	0,00	0,00	900,00	0,00	0,00	1990	ND	ND	Dump of Torshkovichi village, recultivation is required	ND	ND		1998
Pikalevo Town Municipality																
20.9	MSW dump	0,20	0,00	0,00	0,00	250,00	0,00	0,00	ND	ND	ND	ND	None	None		2004
Podporozhje District													-	-		
21.12	MSW dump	0,00	0,00	0,00	0,00	0,00	0,00	0,00				Temporary dump of Podporozhje town	ND	None		1998
Priozersk District														-		
22.2	MSW dump	0,0	0,00	0,00	0,00	0,00	0,00	0,00	ND	-		Permanent dump of Brusnitchny village	Priozersk Municipal Service Enterprise	Administrative resolution 1150-09.03		2004
22.5	MSW dump	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1996	ND	ND	Permanent dump of Petrovsky village	Municipal Administration	Administrative resolution 1150-09.03		2004
22.6	MSW dump	0,0	0,00	0,00	0,00	85,00	0,00	0,00	1986	ND	ND	Permanent dump of Melnikovo village	Priozersk Municipal Service Enterprise	Administrative resolution 1150-09.03		2004
22.8	MSW dump	0,0	75,0	0,00	0,00	0,00	0,00	0,00	ND			Temporary dump of Kom-munary village	ND	None		2004
22.9	MSW dump	0,0	0,00	0,00	0,00	0,00	0,00	0,00	ND	ND	ND	Permanent dump of Vesnino village	Priozersk Municipal Service Enterprise	Administrative resolution 1150-09.03		2004
22.11	MSW dump	0,0	0,00	0,00	0,00	0,00	0,00	0,00	ND	ND	ND	Permanent dump of Zaporozhsky village, unequipped	Sosnovsk Municipal Service Enterprise	Administrative resolution 1150-09.03		2004



22.13	MSW dump	0,0		0,00	0,00	0,00	0,00	0,00	ND	ND	Temporary dump of Sapernoye village, unequipped	ND	ND	2004	-
22.14	MSW dump	0,0		35,0	0,00	0,00	0,00	0,00	1972	ND	Dump of Kuznechnoye village	Kuzhechnoye Village	ND	1998	-
22.15	MSW dump	0,0		0,00	0,00	0,00	0,00	0,00	ND	ND	Permanent dump of Krasnoozernoye village	ND	ND	2004	-
22.18	MSW dump	6,28		0,00	0,00	0,00	0,00	4 000,0	ND	ND	Temporary dump of Sertolovo village	None	None	2004	-
Slantsy District									ND	ND					
25.2	MSW dump	5,00		0,00	0,00	0,00	0,00	0,00	ND	ND	ND	AO "Slantsy Plant"	ND	1998	-
Tikhvin District															
27.3	MSW dump	0,25		0,00	0,00	0,00	0,00	1 650,0	ND	ND	ND	None	-	2004	-
27.4	MSW dump	0,25		0,00	0,00	0,00	0,00	1 940,0	ND	ND	None	None	None	2004	-
27.5	MSW dump	0,12		0,00	0,00	0,00	0,00	60,00	1997	ND	None	None	None	2004	-
27.6	MSW dump	0,30		0,00	0,00	0,00	0,00	60,00	ND	ND	None	None	None	2004	-
27.7	MSW dump	0,70		0,00	0,00	0,00	0,00	299,0	ND	ND	Temporary	None	ND	2004	-
27.8	MSW dump	0,30		0,00	0,00	0,00	0,00	107,0	ND	ND	None	None	None	2004	-
27.08	MSW dump	0,35		0,00	0,00	0,00	0,00	2 350,00	1998	ND	None	None	None	2004	-
27.9	MSW dump	0,00		0,00	0,00	0,00	0,00	0,00	1977	ND	Temporary	None	None	1998	-
27.10	MSW dump	0,01		0,00	0,00	0,00	0,00	330,00	ND	ND	None	None	None	2004	-
27.14	MSW dump	0,00		2 500,0	0,00	0,00	0,00	0,00	1994	ND	Temporary	None	None	1998	-
Tosno District															
28.12	MSW dump	0,00		0,00	0,00	0,00	0,00	0,0	ND	ND	ND	ND	ND	2004	-
28.15	MSW dump	0,10		0,00	0,00	0,00	0,00	0,0	2000	ND	ND	ND	ND	2004	-
28.12	MSW dump	0,20		0,00	0,00	0,00	0,00	28,0	ND	ND	ND	ND	ND	2004	-
28.14	MSW dump	0,30		0,0	0,00	0,00	0,00	0,00	1998	ND	ND	ND	ND	2004	-
28.11	MSW dump	3,00		0,00	0,00	0,00	0,00	20000,0	ND	ND	Temporary dump of Nikolskoye village	None	None	2004	-
Schlossburg Municipality															
29.1	MSW dump	9,00		0,00	0,00	0,00	0,00	25000,0	1970	1991	-	Schlossburg Town Administration			

## Dung and manure storage facilities

Municipality, district / Code	Type	Area, ha	Capacity, ton	Capacity, ton/yr	Accumulated, ton	Commissioning	Closure	Status/condition	Operator	Land user / documents	Inventory audit	Correction
Volosovo District												
2.57	Permanent manure storage facility	2,00	0,00	0,00	0,00	1975	ND	Private, ND	AOZT Kikkerino"	ND	1998	-
2.60	Permanent manure storage facility	1,00	0,00	0,00	0,00	1976	ND	Private, ND	AOZT Siaglitsey	ND	1998	-
2.61	Manure storage facility, unequipped	1,00	0,00	0,00	0,00	1962	ND	Private, ND	AOZT Seltso"	ND	1998	
2.62	Permanent manure storage facility	0,00	0,00	0,00	0,00	lä		Private, ND			1998	-
2.63	Permanent manure storage facility	2,00	0,00	0,00	0,0	1983	ND	Private, reconstruction is required.	ZAO Torosovo		1998	-
2.64	Permanent manure storage facility	1,00	0,00	0,00	0,0	1983	ND	Private, ND	AOZT Trud	ND	1998	
2.65	Permanent manure storage facility	4,00	0,00	0,00	0,0	1974	ND	Private, ND	AOZT Sumino		1998	-
2.66	Permanent manure storage facility	3,00	0,00	0,00	0,0	1989	ND	Private, ND	AOZT Ushevitsey	ND	1998	-
2.67	Permanent manure storage facility	1,00	0,00	0,00	0,0	1974	ND	Private	AOZT Octiabrsky	ND	1998	
2.68	Permanent manure storage facility	4,00	0,00	0,00	4 600,0	1986	ND	Private	OPH Kalozhitsy	ND	1998	-
2.69	Permanent manure storage facility	2,00	0,00	0,00	0,0	1983	ND	Private, ND	OPH Kalitino	ND	1998	-
2.70	Manure storage facility	2,00	0,00	0,00	0,0	lä	ND	Private, ND	AOZT Rabititsy	ND	1998	-
2.71	Permanent manure storage facility	1,00	0,00	0,00	0,0	1974	ND	Private, ND	ZAO BSHT		1998	-
2.72	Permanent manure storage facility	4,00	0,00	0,00	0,0	1974	ND	Private	OAZT Udarnik	ND	1998	-
2.73	Permanent manure storage facility	78,00	0,0	0,0	0,0	1980	ND	Private, ND	AOZT Volna		1998	-
2.74	Permanent manure storage facility	4,00	0,0	0,0	0,0	lä	ND	Private, ND	ND		1998	-
2.76	Permanent manure storage facility	2,00	0,0	0,0	0,0	lä	ND	Private	OAZT Gomontovo		1998	-
Volkhov District												
4.51	Permanent manure storage facility	0,20	0,00	800,0	0,0	1983	ND	Industrial communal KRS Podviazje		ND	1998	-
4.52	Permanent manure storage facility KRS	0,00	0,00	0,00	89000,0	1981	ND	Permanent, equipped	AO Pashskoye	Land of AO Pashskoye	1998	-
4.53	Permanent manure storage facility, unequipped	0,20	1200,0	0,0	0,0	1982	ND	Private, reconstruction is required	Morozovo Company	ND	1998	-
4.54	Permanent manure storage facility	0,00	0,00	0,0	0,0	1982	ND	Private, ND	KRS Khvalovo	ND	1998	-

4.68	Permanent manure storage facility	0,20	1000,0	0,0	0,0	0,0	ND	ND	ND. Com. "Berezhki"	ND		1998	
Vyborg District													
6.51	Manure storage facility, equipped	0,00	2500,0	0,0	0,0	0,0	ND	ND	Permanent	AO Kondratjevo	ND	1998	-
6.61	Permanent manure storage facility	0,00	59000,0	0,0	0,0	0,0	1981	ND	Permanent, AO Pervomajskoye	ND	ND	1998	-
6.62	Permanent manure storage facility	0,00	40000,0	0,0	0,0	0,0	1987	ND	Permanent	AO Pobeda	ND	1998	
6.68	Permanent manure storage facility	0,0	40000,0	0,0	0,0	0,0	1978	ND	Permanent, Krasnaya Dolina Company	ND	ND	1998	
Gatchina District													
8.56	Permanent manure storage facility KRS	8,0	0,00	0,0	0,0	0,0	1988	ND	Closed	AO Novy Svet	ND	1998	
Kirishy District													
11.61	Permanent manure storage facility	0,00	0,0	0,0	0,0	0,0	1975	2006	ND	ND	ND	1998	-
11.62	Permanent manure storage facility KRS	0,00	0,0	0,0	0,0	0,0	1975	ND	Permanent, Glazhevo Company	Glazhevo Company	ND	1998	-
11.63	Permanent manure storage facility, unequipped	0,0	0,00	0,0	0,0	0,0	1975	ND	Private, KRS Ptcheva, reconstruction	Ptcheva Company	ND	1998	-
11.65	Permanent manure storage facility, unequipped	0,0	0,0	0,00	0,0	0,0	1975	ND	Private, recultivation is required	Budogosch Company	ND	1998	-
11.68	Permanent manure storage facility	0,00	0,0	0,0	0,0	0,0	1981	ND	ND	ND	ND	1998	
Kirovsk District													
12.61	Permanent manure storage facility	0,00	0,00	8000,0	0,0	0,0	1978	ND	ND	AO Mginskaya	Land of AO Mginskaya	1998	-
12.64	Dung storage facility	0,00	0,00	0,00	0,0	0,0	1984		Poultry AO Severnaya	ZAO PF Severnaya	ND	1998	-
Lomonosov District													
17.52	Permanent manure storage facility	0,00	0,00	0,0	4000,0	0,0	ND	ND	ND, Kipen Company	ND	ND	1998	-
17.53	Permanent manure storage facility	0,00	0,00	0,0	4150,0	0,0	ND	ND	Industrial KRS Annino, reconstruction is required	ND	ND	1998	-
17.55	Manure storage facility, unequipped	0,00	0,00	0,0	3978,0	0,0	ND	ND	Private, Peniki Company, reconstruction is required	ND	ND	1998	-
17.56	Permanent manure storage facility	0,00	0,00	0,0	13500,0	0,0	ND	ND	ND	AO Gostilitsy	ND	1998	-
17.57	Manure storage facility, equipped	0,00	0,00	0,00	9500,0	0,0	ND	ND	ND	AI Kaporje	ND	1998	-
17.75	Permanent manure storage facility	0,00	0,00	0,0	1000,0	0,0	ND	ND	ND	ND	ND	1998	-
17.76	Permanent manure storage facility	0,00	0,00	0,0	4000,0	0,0	ND	ND	ND	ND	ND	1998	-
17.78	Permanent manure storage facility	0,00	0,00	0,00	4000,0	0,0	ND	ND	ND	ND	ND	1998	-

17.79	Permanent manure storage facility	0,00	0,00	0,0	10000,0	ND	ND	ND	ND	1998	-
Luga District											
18.63	Manure storage facility KRS	0,00	1 500,00	0,00	0,00	1986	ND	ND	ND	1998	-
Prizorskiy District											
22.61	Permanent manure storage facility	0,00	0,	0,00	0,0						
22.62	Permanent manure storage facility	0,00	0,0	0,0	0,0	ND	Permanent, AO Krasnoozernoye*	ND	ND	-	ND
Slantsy District											
25.40	Manure storage facility	0,00	20000,0	0,00	0,00	1980	Private, KRS Novoselje	ND	ND	1998	-
Tikhvin District											
27.55	Permanent manure storage facility	0,00	20000,0	0,00	0,00	0		ND	ND		
27.56	Manure storage facility, unequipped	3,00	10000,0	0,00	0,00	1979	ND	ND	ND	1998	-
27.68	Permanent manure storage facility	0,90	8000,0	0,00	0,00	1988	Industrial KRS Makarjino	AO Shugozero	Land of AO Shugozero	1998	-
Kirovsk District											
12.62	Manure and dung storage facility	0,00	64000,0	0,00	0,00	1984	Permanent, equipped, industrial	AO Siniavinskaya	ND	1998	-
Lomonosov District											
17.51	Dung storage facility	0,00	0,0	0,0	141000,0	ND	ND	AO Gorbunki	ND	1998	-
17.54	Manure storage facility	0,00	0,0	0,0	60000,0	ND	Permanent, process associated	AO PF Russko-Vysotskaya	ND	1998	-
17.61	Dung storage facility	0,00	0,0	0,00	38000,0	ND	Permanent storage	AO Lagolovo	ND	1998	-
17.62	Dung storage facility	0,00	0,0	0,00	4 000,0	ND	Equipped	AO Lopukhinka	ND	1998	-
17.63	Dung storage facility	0,00	0,00	0,00	4 600,0	ND	Equipped		ND	1998	-

## **ANNEX IIb: LIST OF PRIORITY LANDFILLS AND DUMPS IN THE KALININGRAD REGION**

### **REFERENCE INDEX**

#### *INVENTORY OF APPROVED AND ILLEGAL LANDFILLS IN THE KALININGRAD REGION*

Landfills  
Industrial Waste Landfills  
Legal Dumps  
Illegal Dumps  
Dung And Manure Storage Facilities



Pos. No.	Solid wastes dumpsite location	Dumpsite category	Year of dumpsite operation start	Waste quantity tons (1m3 = 0,8 tons)	Actual area, m2	Active/Closed	Illegal/Managed	Annual volume of wastes disposal, m3	Hazardous waste quantity tons	Hazardous waste content and type including origin and chemical composition	Risk characterization
1	Pervomaiskiy town, ul. Susanina	2	1996	400	2500	closed	illegal	100			The dumpsite is not fenced, not controlled; there are no residential houses nearby.
2	Ul. Sverdlovskaya (kindergarten no. 1 and "Oktyabr" garage association)	1	2001	16	400	closed	illegal	8			The dumpsite is not fenced, not controlled; there are no residential houses nearby, the distance to the nearest residence is 50-100 m; the dumpsite is currently in use
3	Lyubinskiy turn, near gardening communities	2	1998	385	400	closed	illegal	85			The dumpsite is not fenced, not controlled. There are no residential houses nearby, the dumpsite is currently in use
4	Ul. Lomonosova, after crossing with ul. Belorusskaya	2	2000	160	100	closed	illegal	65			The dumpsite is not fenced, not controlled; there are no residential houses nearby.
5	1-ya B. Okruzhnaya from ul. Katina to Sovetsky Prospect	2	1998	450	1000	closed	illegal	95			
6	Municipal dumpsite for solid wastes in Kosmodemyanovskogo town, located on the western outskirts of Kaliningrad	5	1978	22.3 M	180 000	active	managed	900 000			The dumpsite is surrounded by forests of the 1st group. On the eastern side of the dumpsite the Pregolya river flows. The dumpsite is located in a bogged area. There is an access road leading to the dumpsite. The site has a domestic zone and a main gate checkpoint. The wastes arriving to the dumpsite are visually controlled. Lagoon storage technology with intermediate isolation of wastes is observed.
7	1.5 km from Kruglovo town up to motor road Kruglovo-Povarovka	5	1977	1,1 M	30 000	active	managed	60 000		Contain 3rd hazard class waste	The dumpsite is located in a forest in 300 m from motor road; it is not fenced nor ridged
8	Sosnovka town, in 2 km from Zelenogradsk town	5	1946	1,1 M	40 000			30 000			The dumpsite is not fenced, partially ridged; is currently in use
9	0.8 km southward of Romanovo town	2	1993	240	10 000			60			The dumpsite is not fenced, there are forests on the southern and eastern sides and pasture lands on the western and northern sides
10	Near Russkoye town, in 300 m from motor road Kulikovo-Krasnotorovka	2	unknown	240	10 000						The dumpsite is located in an old quarry
11	Muromskiy rural settlement, along motor road Sosnovka-Bezmyanka	2	unknown	200	1 500						The dumpsite is located on the edge of a forest; the wastes are stored as separate piles; a stream flows in 200 m
12	Muromskiy rural settlement, in 100 m from motorway Melnikovo-Romanovo	2	unknown	200	2 500						The dumpsite is located on an elevation, in 30 m from a stream and in 100 m from a small lake
13	Near Kulikovo town, in 30 m from motor road Romanovo-Kovrovo	2	unknown	160	2000						Separate litter thrown from cars
14	On the boundary between Kulikovo and Zaostrovye towns	2	1998	400	4000			100			The dumpsite is located between Zaostrovye and Kulikovo towns; there is an earthen access road covered with gravel and sand mixture.

Pos. No.	Solid wastes dumpsite location	Dumpsite category	Year of dumpsite operation start	Waste quantity tons (1m <sup>3</sup> = 0,8 tons)	Actual area, m <sup>2</sup>	Active/Closed	Illegal/Managed	Annual volume of wastes disposal, m <sup>3</sup>	Hazardous waste quantity tons	Hazardous waste content and type including origin and chemical composition	Risk characterization
15	Westward of Selskoye town at the distance of 2 km, Gorbavka town	2	1998	160	5000			50		Hard-coated access road 2 km and field road 100 m	
16	Ul. Tsentralnaya, Melnikovo town	1	unknown	8	400			None		(various wastes) construction and domestic wastes are located on open surface in 500 m from a community	
17	Kostrikovo-Prokhladnoye, 1,5 km from Kostrovo town	4	1970	35000	7000			1500		The dumpsite is not fenced, not controlled; it is situated to the left from the road; there is a small forest to the north from the dumpsite. The dumpsite is currently in use	
18	Konstantinovka town, quarry, 600 m westward of the town	3	1998	1450	450			300		Not controlled, access roads are available around the territory; the dumpsite is currently in use	
19	Rodniki town, quarry, 1,200 m northward of the town	3	1992	6300	20 000			1200		The dumpsite is not fenced, not controlled, access roads are available. There are pasture lands on the north and south of the dumpsite and croplands – on the west and east.	
20	500 m northward of Barsukovka town	2	1998	320	10 000			70		The dumpsite is ridged with earthen levee and has no visible impact on environment; the dumpsite is currently in use.	
21	400 m northward of Matrosovo town	1	2000	70	90			25			
22	3 km south-westward of Shosseynoye town	3	1998	1200	1500			None		The distance to the residential area is 3 km; croplands surround the dumpsite	
23	Between Zelenopolye and Lugovoye towns	2	1992	320	800			45		The dumpsite is not fenced, not controlled; pasture lands for private cattle are located around. The dumpsite is currently in use.	
24	400 m north-eastward of Ilyichevo town, Marshalskiy	5	1991	380 000	13 000	active	managed	28 000		The dumpsite is fenced, controlled, access roads are available; the dumpsite is surrounded by pasture lands and is currently in use	
25	500 m north-westward of Matrosovo town	2	1993	340	600			55		The dumpsite is situated along the road near a forest. It contains domestic wastes. The dumpsite is currently in use.	
26	Northward of Tsvetkova town	3	1960	6000	7500			160		Old quarry of sand up to 10 m deep and 80 m wide. There are functioning cemeteries near the dumpsite.	
27	900 m from motor road Kaliningrad-Polesk, 600 m from Polesk town	3	1985	6900	99 000			1200		The dumpsite is not fenced, but controlled, access roads are available; the dumpsite is continuously cultivated and used	
28	Westward of Golovkino town, in 30 km from Polesk town and 300 m from Golovkino town	1	1994	65	2500			10		The dumpsite is not fenced, not controlled, access road is available	
29	Along the road Berezovka-Bogatovo, 500 m from Berezovka town, 2 km from Sosnovka town	2	1990	560	3000			120		The dumpsite is fenced; access road is available. There are pasture lands and hayfields around the dumpsite. In 300 m northward of the dumpsite there is a forest.	

Pos. No.	Solid wastes dumpsite location	Dumpsite category	Year of dumpsite operation start	Waste quantity tons (1m3 = 0,8 tons)	Actual area, m2	Active/Closed	Illegal/Managed	Annual volume of wastes disposal, m3	Hazardous waste quantity tons	Hazardous waste content and type including origin and chemical composition	Risk characterization
30	In 7 km from motor road Kaliningrad-Polessk- Sovetsk and Lipovka town	2	1990	400	5000			1020			In 400 m north-westward of the dumpsite there is a forest. The dumpsite has no negative impact on environment, except for litter blown around by wind.
31	Krasnoholmskoye town, in 30 km from motor road Kaliningrad-Polessk-Sovetsk, 100 m north-westward of the town	3	1995	800	2000			100			In 300 m westward of the dumpsite there is a cattle farm. The dumpsite is not fenced. The dumpsite is surrounded by hayfields and pasture lands owned by OAO Zaleskoye Moloko
32	Lomonosovka town, in 3 km from motor road Kaliningrad-Polessk-Sovetsk, 300 m from the town	3	1993	4000	5000			450			The dumpsite is not fenced, not controlled, access road is available. To the right from the dumpsite there is a garden; on two sides there are land plots owned by the town citizens.
33	Saranskoye town, in 1 km from motor road Kaliningrad-Polessk-Sovetsk, 150 m westward of the town	3	1993	6400	8000			750			The dumpsite is not fenced; not controlled, access road is available. There are pasture land and gardens around the dumpsite.
34	Novaya Derevnya town, in 100 m from motor road Polessk-Novaya Derevnya-Gvardeysk, 1,5 km northward of the town	3	1993	2250	2800			300			The dumpsite is not fenced; not controlled, access road is available. There are hayfields around the dumpsite, in 100 m from bituminous road to Novaya Derevnya town.
35	150 m from the town edge towards Nesterov town	2	1978	640	400			33			An earth-ridged storage pit on the bottom of sand old quarry.
36	Krasnolesye town, 2 km to the west	3	1985	6400	10500			650			There is a lake in 700 m from the town. The dumpsite is situated in a former quarry; access roads are available. There are pasture lands on the dumpsite territory. The wastes are not blown around by the wind, since the dumpsite is protected by trees. The dumpsite is currently in use
37	Furmanovka town, 2 km to the north-east	1	1991	4	100			None			In 1 km from the dumpsite there are workshops of ZAO Furmanova and agricultural lands
38	Sadovoye town, 1 km to the south-east	1	1875	4	200			None			In 0.5 km from the dumpsite there are workshops of ZAO Sadovoye and agricultural lands
39	Nevskoye town, 300 km from the town	1	1985	80	2000			10			The dumpsite is not fenced, access roads are available. The dumpsite has no visible impact on the environment (hayfields) except for the litter (plastic, paper) blown around by wind.
40	Prigorodnoye town, 1.5 km eastward of Prigorodnoye town	2	1980	240	15000			20			The right side of the dumpsite is not fenced, access roads are available; there is a hayfield beyond the dumpsite. The dumpsite is currently in use
41	Lugovoye town, 2 km westward of Lugovoye town	1	1991	80	1000			10			The dumpsite is not fenced. The dumpsite has no visible impact on the environment, except for plastic film blown around by the wind. The dumpsite is currently in use.

Pos. No.	Solid wastes dumpsite location	Dumpsite category	Year of dumpsite operation start	Waste quantity tons (1m <sup>3</sup> = 0,8 tons)	Actual area, m <sup>2</sup>	Active/Closed	Illegal/Managed	Annual volume of wastes disposal, m <sup>3</sup>	Hazardous waste quantity tons	Hazardous waste content and type including origin and chemical composition	Risk characterization
42	Babushkino town, 2 km eastward of Babushkino town	1	2002	8	1000			10			The dumpsite is situated in 2 km from Babushkino town, along the road passing by a pond in ul. Gornova. The dumpsite is ridged, not fenced and has no negative impact on environment.
43	Nesterov town, 1,000 m southwestward of Nesterov town	5	1961	108 000	45 000			16000			The dumpsite is not fenced; access roads are available. There are pasture lands around the dumpsite. The dumpsite has no visible impact on the environment, except for the litter blown around by wind.
44	200 m from Pushkino town	1	1992	80	2500			10			The dumpsite is not fenced, access roads are available. The dumpsite makes no visible harm to the environment, except for the litter blown around by wind.
45	100 m eastward of Kalinino town	2	1980	640	2000	active	managed	20			The dumpsite is not fenced, is controlled, access roads are available; there are agricultural lands around the dumpsite and protected forest belts eastward of the site. The dumpsite has no visible impact on the environment, except for the litter blown around by wind. The dumpsite is currently in use
46	Lugovoye town, missile range of former military town, in 500 m	3	1999	6100	1750	Active	managed	1800			The dumpsite is situated on the territory of former missile range of a military town, in 500 m from residential zone; there is a lake in 1,000 m from the site. The dumpsite is not fenced. Access roads are available; the dumpsite is surrounded by military range.
47	Krymskoye town, 0.5 km eastwards	1	1992	8	200			40			The dumpsite is situated in a pit in 50 m from a motordrome of Zheleznodorozhny and Krylovo towns.
48	South-westward of Nikitino town	2	1989	320	3000			40			The dumpsite is not ridged, not fenced; it is situated in an old quarry.
49	Crossroads of Znamenka-Volnoye and Chaadayevo town roads, 2 km north-eastward of Chaadayevo town	2	2001	200	3000			100			Not ridged nor fenced
50	400 m northward of Mozyr town	2	1995	200	600			40			The dumpsite territory is not fenced, nor ridged; there is pasture land near the site.
51	800 m northward of Linevo town	2	2000	120	150			50			The territory is not fenced nor ridged
52	100 m south-eastward of Shevtsovo town	2	1999	400	8000			100			Sand quarry, land unsuitable for agriculture (ravines); the dumpsite is not fenced.
53	1,800 m northward of Podlipovo town	2	2000	200	200			80			The dumpsite territory is not fenced and not ridged.
54	1,500 m south-westward of Druzhba town	2	1982	170	8000			10			In 300 m from the Stogovka – Mazurka rivers

Pos. No.	Solid wastes dumpsite location	Dumpsite category	Year of dumpsite operation start	Waste quantity tons (1m3 = 0,8 tons)	Actual area, m2	Active/ Closed	Illegal/ Managed	Annual volume of wastes disposal, m3	Hazardous waste quantity tons	Hazardous waste content and type including origin and chemical composition	Risk characterization
55	400 m north-eastward of Lugovoye town	1	1999	30	600			10			In 350 m from the Zernovka and in 400 m from the Lava rivers
56	1,000 m northward of Frunzenskoye town	2	2001	320	8000			200			Not ridged, nor fenced
57	300 m northward of Domnovo town	2	1978	85	10 000			40			The dumpsite is ridged; there is a pasture nearby
58	North-western outskirts of Zheleznodorozhny town, 300 m	5	1965	56000	20 000			3000			In 300 m from bituminous road, not fenced. The dumpsite is currently in use
59	Pravdinsk town, 1 km south-eastwards	5	1975	40 000	30 000			4200			The dumpsite is not fenced, is controlled during worktime. Access roads are available. There are agricultural fields to the north-west from the site and forests – on all other sides. The dumpsite is currently in use.
60	Rodniki town. Quarry in 1,200 m northward of the town	3	1992	6300	20 000			1200			The dumpsite is not fenced; not controlled, access roads are available. There are pasture lands to the north and south of the dumpsite and croplands – to the west and east. The dumpsite is currently in use
61	Baltiysk city, eastern outskirts	4	1992	24 000	30 000	Closed		None			The dumpsite is not fenced. It is surrounded and thus limited by dacha plots and is not used. Reclamation is in progress.
62	Gusev town, along the right side of motor road Gusev-Ozersk, 300 m	5	1984	600 000	38 400	active	managed	42 000			The dumpsite is not fenced, but ridged with an earthen levee about 2 m high along the perimeter. Access roads (improved earth road) are available. To the north from the dumpsite there are lands belonging to an instructional farm of Technical School no. 17; to the east there is pasture land and to the south and west there are reserve lands covered by trees, shrubs and bogs. The western edge of the dumpsite is adjoined by a pond connected to other water bodies by ameliorative channel. Dominant winds blow from dumpsite towards the town.
63	Furmanovskiy rural settlement, westward of Furmanovo town, ul. Zelenaya, 100 m	1	1980	40	200			5			The dumpsite is not fenced. Access roads are available. There is a small forest in 50 m from the dumpsite. The dumpsite has no visible impact on the environment.
64	Furmanovskiy rural settlement, eastward of Sinyavino town, 200 m	1	1980	32	150			4			The dumpsite is surrounded by a small forest at the distance of 50 m. There are no water supply sources.
65	Furmanovskiy rural settlement, westward of Podduby town	1	1980	24	150			4			The dumpsite is not fenced. There are small shrubs around. The dumpsite has no visible impact on the environment.



Pos. No.	Solid wastes dumpsite location	Dumpsite category	Year of dumpsite operation start	Waste quantity tons (1m <sup>3</sup> = 0,8 tons)	Actual area, m <sup>2</sup>	Active/Closed	Illegal/Managed	Annual volume of wastes disposal, m <sup>3</sup>	Hazardous waste quantity tons	Hazardous waste content and type including origin and chemical composition	Risk characterization
66	Furmanovskiy rural settlement, Lermontovo town, 150 m southwards	1	1980	16	200			3			The dumpsite is not fenced, not guarded. There are shrubs around. The dumpsite has no visible impact on the environment.
67	Furmanovskiy rural settlement, Furmanovo town, 50 m southwards	1	1980	24	200			3			The dumpsite is not fenced, not guarded. There is a small forest around the dumpsite. The dumpsite has no visible impact on the environment.
68	Bryanskij rural settlement, Bryanskoye town	1	1994	40	300			8			The dumpsite is situated in 30 m from a bituminous road and in 10 m from a cemetery. The dumpsite is not fenced and not controlled. The dumpsite has no visible impact on the environment.
69	Bryanskij rural settlement, Bryanskoye town, ul. Sadovaya	1	1980	65	300			8			There are agricultural lands and vegetable gardens between the dumpsite and residential houses. The distance from the bituminous road to the dumpsite is 15 m. The site is not fenced and not controlled.
70	Bryanskij rural settlement, Pervomayskoye town, between ul. Molodezhnaya, ul. Tsentrlnaya and ul. Stroitelnaya	1	1980	40	500			5			The dumpsite is situated in 200 m from the town central road and in 50 m from residential houses. There are pasture land and cattle sheds between the houses and dumpsite. The site is not fenced and not controlled.
71	Pokrovskiy rural settlement, southward of Priozernoye town towards Lomovskoye field	2	1960	800	11000			100			The site is not fenced, not controlled, access roads are available. The dumpsite is surrounded by pasture lands. There is the Pissa river southward of the dumpsite. The dumpsite is in use, but it is not permitted.
72	Maiskiy rural settlement, Maiskoye town, ul. Pobedy, southern part of the town	1	1999	50	120			15			The dumpsite is not fenced, not controlled, there are no access roads. In 50 m to the left from the dumpsite there is a school garden. Further to the south, in 150 m there is pasture land.
73	Mayakovskiy rural settlement, Mayakovskoye town, cross-roads of ul. Shkolnaya and ul. Polevaya, 500 m northwards	2	1980	120	180			12			The dumpsite is not fenced, not controlled, access road is available.
74	Zorinskiy rural settlement, westward of Zorino town, 550 m	2	1997	400	5500			80			In 120 m eastward of the dumpsite there is an ameliorative channel. The dumpsite is located on the area with partial hard coating: in the north it is fenced by shrubs; on other sides it is not fenced; the site is not controlled, access roads are available. In the west, south and east the dumpsite is adjoined by public pasture land of Zorino town. In the north there are lands owned by ZAO Zorino.
75	Znamenskoye town, Yelniki town – 2.5 km	5	1993	82 000	35 250	active	managed	15 000			The distance to the Pregolya river is 15 km to the west. There are fields in the east and south, and motor road Ozerki-Znamensk in the north. The levee is 3.5 m high; a technician and watchmen work at the dumpsite; access roads are available; the dumpsite is located on open terrain.

Pos. No.	Solid wastes dumpsite location	Dumpsite category	Year of dumpsite operation start	Waste quantity tons (1m <sup>3</sup> = 0.8 tons)	Actual area, m <sup>2</sup>	Active/ Closed	Illegal/ Managed	Annual volume of wastes disposal, m <sup>3</sup>	Hazardous waste quantity tons	Hazardous waste content and type including origin and chemical composition	Risk characterization
76	120 m south-westward of Kuybyshevskoye town, along road to Znamensk town	1	1993	40	2900			5			The dumpsite is situated in a ravine located to the left from the road to Znamensk. On the other side there are croplands. The dumpsite is not fenced, not controlled.
77	Talpakı town, along ul. Sovetskaya, on the northern side of cemetery, in ravine	1	1990	16	300			2			There is a cemetery on the western side; in 12 m there is road to Orekhovo. The dumpsite is not fenced, not controlled.
78	Krasny Yar town, ul. Novaya, in 20 m eastward of house no. 22	1	1998	32	140			5			The dumpsite is situated in two pits dug for the construction of residential houses. It is not fenced and not controlled
79	Ozerskiy rural settlement, Berezovka town, 2.5 km from the town	1	1983	80	300			5			The dumpsite is situated in 800 m from a forest. There are no lakes and water supply systems around, as well as pasture lands. The dumpsite is surrounded by non-functional agricultural lands. The site is not controlled, not fenced. Access road is available, but its condition is poor. The dumpsite is currently in use
80	Borskiy rural settlement, Yablonevka town	1		40	260						
81	Sovetsk city, ul. Mayakovskogo, within the city boundaries	5	1965	3.7 M	78 000	active	managed	109 000			The dumpsite is situated near residential area, open water bodies and in frontier zone. Residential houses are in 300 m from the dumpsite. The dumpsite is not fenced. The dumpsite is steeply inclined towards the Uzkaya river. Fires are very frequent at the dumpsite; it is currently in use.
82	Southward of Mamonovo town, on 1.6 km of motor road Mamonovo-Branevo, in 900 m from the road	5	1960	330 000	30 000	active	managed	10 800			The dumpsite is situated in 500 m from gardening community Rassvet; in 800 m the Mamonovo's river flows to the north. The dumpsite is not fenced, it is controlled; access roads are available on the territory; the dumpsite is surrounded by shrubs and is currently in use.
83	Krasnoznamensk town, western outskirts of the town, 500 m eastward of ul. Dachnaya	3	1976	8 000	4700	active	managed	1000			The dumpsite is not fenced; it is situated on open terrain, on the lands belonging to the town; it is controlled by local Municipal Public Utility Enterprise. The dumpsite is currently in use
84	Pravdinskiy rural settlement, Novouralskoye town, ul. Sovetskaya	2		160	500			10			Rummage, litter, tree branches, domestic wastes. The dumpsite is not fenced. It is a former German garden located in 500 m from the nearest residence. The dumpsite is currently in use.
85	Nemanskiy rural settlement, Nemanskoye town, western part, old quarry in 2.5 km to the west	1	1994	40	5000			50			The dumpsite is surrounded by forests; the distance to the nearest water body (the Neman river) is 700 m; there is an earth road 2.5 km long.
86	Nemanskiy rural settlement, southern part of Nemanskoye town, 800 m southward of the nearest houses	1	1994	72	900	active	managed	10			The dumpsite is situated in an old quarry of a brickyard. In the south and west it is adjoined by forest at the distance of 100 m; northern part is vegetated by shrubs.

Pos. No.	Solid wastes dumpsite location	Dumpsite category	Year of dumpsite operation start	Waste quantity tons (1m <sup>3</sup> = 0,8 tons)	Actual area, m <sup>2</sup>	Active/Closed	Illegal/Managed	Annual volume of wastes disposal, m <sup>3</sup>	Hazardous waste quantity tons	Hazardous waste content and type including origin and chemical composition	Risk characterization
87	Pobedenskiy rural settlement, 3 km eastward of Pobedino town	3	1994	4000	2500			750			The dumpsite is fenced, not controlled, access roads are good for 2,3 km; earth road is 700 m long.
88	Vesnovskiy rural settlement, Vesnovo town, 400 m to the north-east	2	1978	560	2000			30			The dumpsite is situated in the north-east, in 400 m from Vesnovo town. It is not controlled, not fenced; there is a hayfield near the site.
89	Vesnovskiy rural settlement, Uzlovoye town; located beyond the town, on the north-west, along motor road Uzlovoye-Krasnoznamensk, 200 m	1	1988	72	1500			15			The dumpsite is not fenced, not controlled. There is a meadow nearby.
90	Pravdinskiy rural settlement, Poltavskoye town, in the end of ul. Sadovaya	2	2000	480	600			100			An excavated pit where all wastes are dumped to and then burnt. The site is not fenced and is currently in use
91	Pr4avdinskiy rural settlement, in 1.5 km from Pravdino town towards Nikitino town	2	1993	600	2500			100			The dumpsite is situated in a former garden; the access road is bitumen-coated. The access road is circular. The dumpsite maintenance is provided by the residents of Pravdinskiy rural settlement. The site is not fenced and is currently in use.
92	Dobrovolsk town; located in 1.5 km to the west from the town, along the road to Gusev	3	1996	8 000	15 700	active	managed	2000			The dumpsite is not fenced; access roads are available. It is situated on the town territory and is currently in use
93	Timofeyevskiy rural settlement; 3 km northward of Timofeyevo town	3	1998	2000	50 600			500			The wastes brought to the dumpsite are mainly produced by population residing nearby. The dumpsite is currently in use.
94	Timofeyevskiy rural settlement, in 2 km westward of Bobrovo town	3	1990	1200	30 000			300			There are hayfields and pasture lands near the dumpsite; the dumpsite is currently in use.
95	Pionerskiy town, between ul. Rabochaya	4	No data	10 000	4200			1920			The dumpsite is not fenced, it is reclaimed and is used for swept litter only
96	1,000 m from Ozersk town, ul. Bagrationa	5	1946	160 000	25 000	active	managed	5000			The dumpsite is situated in 1,000 from Ozersk town. The dumpsite has no visible impact on the environment, except for the litter blown around by wind and occasional fires.
97	Bagrationovskiy rural settlement, Suvorovka town	1		48	500						
98	Gavrilovskiy rural settlement, outside the boundaries of Gavrilovo town, 800 m	1	1992	16	800			20			The dumpsite is not fenced. The dumpsite has no visible impact on the environment, except for the litter blown around by wind and occasional fires.
99	Gavrilovskiy rural settlement, outside Yablonevka town	1	1990	24	800			30			
100	Gavrilovskiy rural settlement, outside Karamyshevo town, 1,200 m	1	1993	24	800			30			The dumpsite is not fenced. The dumpsite has no visible impact on the environment, except for the litter blown around by wind.

Pos. No.	Solid wastes dumpsite location	Dumpsite category	Year of dumpsite operation start	Waste quantity tons (1m3 = 0,8 tons)	Actual area, m2	Active/Closed	Illegal/Managed	Annual volume of wastes disposal, m3	Hazardous waste quantity tons	Hazardous waste content and type including origin and chemical composition	Risk characterization
101	Sadovskiy rural settlement, Sadovoye town, former quarry	1	1997	32	3000			40			The dumpsite is not fenced. The dumpsite has no visible impact on the environment, except for the litter blown around by wind and occasional fires.
102	Sadovskiy rural settlement, Krasnoyarskoye town, former quarry, 750 m	1	2000	48	3000			60			The dumpsite is not fenced. The dumpsite has no visible impact on the environment, except for the litter blown around by wind.
103	Lvovskiy rural settlement, Lvovskoye town, 900 m along ul. Tsentralnaya	1	1978	40	2000			50			The dumpsite is not fenced. The dumpsite has no visible impact on the environment, except for the litter blown around by wind.
104	Nekrasovskiy rural settlement, Novostroyevo town, along ul. Tsentralnaya, in a forest near farms of ZAO	1	1973	48	1000			53			The dumpsite is not fenced. The dumpsite has no visible impact on the environment, except for the litter blown around by wind.
105	Novostroyevskiy rural settlement, Novostroyevo town, along ul. Tsentralnaya, in a forest near farms of ZAO	1	1978	40	1500			50			
106	Chapayevskiy rural settlement, in 1 km north-eastward of Dolgorukovo town, 1,4 km	5	1992	136 000	24 000	active	managed	17 000			The dumpsite is situated in a quarry, not fenced; it is controlled in daytime.
107	Nivenskiy rural settlement, north-westwards, in 1 km from Nivenskoye town	3	1993	1 200	6000	active	managed				In 80 m there is a small lake. The dumpsite is surrounded by pasture lands.
108	Pogranichny rural settlement, in 2 km northward of Bolshe-dorozhnoye town	2	1994	480	1400			100			The dumpsite is situated in the end of Sadovaya street, in an excavated pit where all wastes are dumped into and then burnt. The site is not fenced.
109	Pushkinskiy rural settlement, in 2,5 km south-eastward of Slavskoye town	1	1995	72	10 000			None			The dumpsite is situated in 1,5 km from the road Slavskoye – Grigoryevka.
110	Pushkinskiy rural settlement, in 2 km north-westward of Podgornoye town	1	1993	40	6800			None			The dumpsite is situated in a former quarry for sand production; now it is not operated.
111	Cheshskiy rural settlement, in 6 km south-eastward of Tishino town, in 30 m from motor road Tishino-Domnovo	1	1995	8	5000			1			Former quarry for sand production.
112	Chekhovskiy rural settlement, in 1,5 km from Chekhovo town, along motor road Chekhovo-Armeyskoye	3	1992	960	4000			100			The site is not fenced, not controlled, situated in a former quarry.
113	Kornevskiy rural settlement, MUE "Public Utility Facilities of Kornevo town", Kornevo town – 1,500 m	1	1998	80	4200	active	managed	66			The dumpsite is not fenced, not controlled, access roads are available. The dumpsite is surrounded by wasteland vegetated by weeds and trees of low value. The dumpsite is currently in use.

Pos. No.	Solid wastes dumpsite location	Dumpsite category	Year of dumpsite operation start	Waste quantity tons (1m <sup>3</sup> = 0,8 tons)	Actual area, m <sup>2</sup>	Active/Closed	Illegal/Managed	Annual volume of wastes disposal, m <sup>3</sup>	Hazardous waste quantity tons	Hazardous waste content and type including origin and chemical composition	Risk characterization
114	Chekhovsky rural settlement south-eastward of motor road Kaliningrad-Bagratiyovsk	2	1960	720	600			None			The dumpsite is situated in 1 km from a brook. The dumpsite represents a trench 4 m wide, 150 m long and 1.5 m deep; it has been backfilled with soil and leveled. There is some litter in some areas on the backfill soil surface.
115	Pogranichny rural settlement, 1 km north-eastward of Pogranichny town	2	1995	320	800			22			There is a hayfield around the dumpsite. The dumpsite is not fenced and not guarded. There is a forest belt on the east and west.
116	Pyatidorozhny rural settlement, 1.5 km northward of Novoselovo town	3	1965	2800	7000	active	managed	92			The dumpsite is not fenced and not guarded.
117	Pyatidorozhny rural settlement, northward of Novoselovo town and in 1.5 km south-westward of Pyatidorozhnoye town	3	1993	8 000	2100	active	managed	1050			There is a lake in 300 m south-eastward of the town. The site is not fenced and not controlled.
118	Nivensky rural settlement, in 1.2 km from Partizanskoye town	3	1975	1200	2500	active	managed	60			The site is in 1 km eastward of mechanical workshops of Partizanskoye town
119	Zapovednenskiy rural settlement, in 1.5 km from Zapovednoye town	2	1997	185	10 000	active	managed	35			The dumpsite is not fenced, access roads are available, the dumpsite is currently in use
120	Zapovednenskiy rural settlement, in 1 km from Berezhki town	1	1997	65	5000	active	managed	12			The site is not fenced, not controlled. Access roads are available. The dumpsite has no visible impact on the environment.
121	Bolshkovskiy rural settlement, 100 m from Dzerzhinskoye town, 7 km northward of Bolshakovo town centre, in western direction	4	1994	12 000	15 000	active	managed	1600			The dumpsite is not fenced, not controlled, access roads are available, the dumpsite is currently in use
122	Bolshakovskiy rural settlement, Pridorozhnoye town, ul. Chernyakhovskogo	3	1994	8 000	10 000	active	managed	1000			The dumpsite is situated northward of Bolshakovo town. The dumpsite is surrounded by agricultural lands; it is not fenced, not controlled, access roads are available, the dumpsite is currently in use
123	Gastelovskiy rural settlement, 1,000 m beyond Gastelovo town	3	1998	3200	2400	active	managed	500			The site is not fenced, access roads are available
124	Bolshakovskiy rural settlement, Bolshakovo town, on crossroads of ul. Sovetskaya and ul. Pushkina	4	1992	24 000	20 000	active	managed	2700			The site is situated in 300 m westward of Bolshakovo town; it is surrounded by pasture lands; there is an isolated farmyard in 300 m from the dumpsite. The site is not fenced, not controlled, access roads are available, the dumpsite is currently in use
125	Neman town, ul. Gorkogo 400	5	1969	160 000	28 000	active	managed	10 000			Landfill for domestic solid wastes is situated in the western outskirts of the town; it is not fenced; Controlled during daytime. In the north there is a railway and in the south, east and west there are fields. The dumpsite is currently in use.



Pos. No.	Solid wastes dumpsite location	Dumpsite category	Year of dumpsite operation start	Waste quantity tons (1m3 = 0,8 tons)	Actual area, m2	Active/Closed	Illegal/Managed	Annual volume of wastes disposal, m3	Hazardous waste quantity tons	Hazardous waste content and type including origin and chemical composition	Risk characterization
126	Ulyanovskiy rural settlement, in 1 km north-eastward of Ulyanovo town	2	1997	160	10 000			50			The dumpsite is situated on open terrain, in 500 m from pasture land. It is not fenced and is currently in use.
127	Zhilinsky rural settlement, Zagorskoye town	1	1990	80	10 000	active	managed	70			The dumpsite is situated in 100 m from municipal lands and in 100 m from bituminous motor road Neman-Zhilino. It is not fenced, not controlled. In 700 m there is a brook; no fires have been observed; the dumpsite is currently in use.
128	Kanashsky rural settlement, Kanash town, ul. Molodezhnaya	1	1979	40	300	active	managed	2			The dumpsite is situated in 50 m from residential houses; it is not fenced, not controlled, access roads are available, the dumpsite is currently in use.
129	Kanashsky rural settlement, Kanash town, ul. Shkolnaya	1	1970	50	300			2			The dumpsite is situated in 50 m from residential houses; it is not fenced, not controlled, access roads are available, the dumpsite is currently in use.
130	Luninskiy rural settlement, Lunino town, houses 1-3	1	1970	16	20	active	managed	3			In 20 m to the east there is a water body. The dumpsite is not fenced, not controlled, periodically cleaned by local population; access roads are available, the dumpsite is currently in use.
131	Luninskiy rural settlement, houses 4-6	1	1972	60	740			3			The dumpsite is situated in 20 m westward of houses nos. 4 and 6, between vegetable gardens and household outbuildings. It is not fenced, not controlled. Access roads are available; the site is in use.
132	Luninskiy rural settlement, Lunino town, houses 5-7	1	1975	48	60	active	managed	3			Dumpsite for domestic solid wastes is situated in 10 m eastward of houses nos. 5 and 7. In 30 m to the east there is a water body, which is littered. Fires are possible. There are residential houses, household outbuildings and vegetable gardens around the dumpsite. The site is not fenced, not controlled, periodically cleaned by local residents.
133	Luninskiy rural settlement, Lunino town, house 13	1	1975	56	120			3			Dumpsite for domestic solid wastes is situated in 30 m from house no. 12, between vegetable gardens and household outbuildings. It is not fenced, not controlled, access roads are available, the dumpsite is in use.
134	Luninskiy rural settlement, Lunino town, house 14	1	1982	32	40			3			The dumpsite is situated in 30 m from residential house no. 14. It is not fenced, not controlled, cleaned by the town residents, access roads are available, the site is in use.
135	Malomazhayskiy rural settlement, 2 km from Malomazhayskoye town	2	1990	240	300	active	managed	30			The dumpsite is not fenced, not controlled. Access roads are available, the site is in use.
136	Rakitskiy rural settlement, Rakitino town, 13 Sadovaya ul.	1	1975	80	800	active	managed	3			The dumpsite is located in 200 m from residential houses. It is not fenced and not controlled. Access roads are available, the site is in use.

Pos. No.	Solid wastes dumpsite location	Dumpsite category	Year of dumpsite operation start	Waste quantity tons (1m3 = 0,8 tons)	Actual area, m2	Active/Closed	Illegal/Managed	Annual volume of wastes disposal, m3	Hazardous waste quantity tons	Hazardous waste content and type including origin and chemical composition	Risk characterization
137	Rakitskiy rural settlement, Rakitino town, ul. Polevaya	1	1965	80	200			4			The site is not fenced, not controlled, access roads are available, the site is in use.
138	Rakitskiy rural settlement, Rakitino town, 8 Polevaya ul.	1	1965	80	200			3			The dumpsite is situated in 100 m from a residential house; it is not fenced, not controlled, access roads are available, the site is currently in use.
139	Rakitskiy rural settlement, Rakitino town, near park	1	1949	80	400			4			The dumpsite is situated at the edge of a park. It is not fenced, not controlled. Access roads are available. The dumpsite has no visible impact on the environment; it is currently in use.
140	Rakitskiy rural settlement, Rakitino town, 5 Tsentralnaya ul.	1	1980	80	200			5			The dumpsite is located near the town road. It is not fenced, not controlled, access roads are available, the site is currently in use.
141	Rakitskiy rural settlement, Rakitino town, near bathhouse	1	1985	80	200			5			The dumpsite is situated in the outskirts of the town. It is not fenced, not controlled. Access roads are available. The site is currently in use.
142	Rakitskiy rural settlement, Krasnoye Selo town, 8 Krasnoselskaya ul.	1	1980	80	400			5			The dumpsite is situated in 50 m from residential houses. It is not fenced, not controlled, access roads are available; the site is currently in use.
143	Rakitskiy rural settlement, Krasnoye Selo town, 9 Krasnoselskaya ul.	1	1980	80	400			5			The dumpsite is not fenced, access roads are available. The dumpsite has no visible impact on the environment and is currently in use.
144	Ulyanovskiy rural settlement, in 0.5 km from Ulyanovo town	1	2001	80	500	active	managed	30			The dumpsite is situated on open terrain, in 0.5 km from Ulyanovo town. It is not fenced. The dumpsite has no visible impact on the environment, except for the litter blow around by wind. The site is currently in use.
145	Chernyakhovsk town, ul. Chapayeva	5	1970	2.6 M	47 800	active	managed	85 000			The dumpsite is situated in 700 m from the town centre. Access road is available. It represents a large municipal dumpsite located on open terrain. The dumpsite has no visible impact on the environment and is currently in use.
146	Krasnopolyanskiy rural settlement, Veselovka town	1	2000	65	2500						
147	Krasnopolyanskiy rural settlement, Krasnopolyanskoye town	1	2002	24	2500						
148	Krasnopolyanskiy rural settlement, Timofeyevka town	1	1997	48	2500						
149	Kamenskiy rural settlement, Kamenskoye town	1	1997	40	1200						
150	Glushkovo town	1	1997	32	800						
151	Zagorskiy rural settlement, Smorodinovo town	1	1998	48	2000	active	managed				
152	Kaluzhskiy rural settlement, Kaluzhskoye town	1	1997	56	1000						

Pos. No.	Solid wastes dumpsite location	Dumpsite category	Year of dumpsite operation start	Waste quantity tons (1m3 = 0,8 tons)	Actual area, m2	Active/ Closed	Illegal/ Managed	Annual volume of wastes disposal, m3	Hazardous waste quantity tons	Hazardous waste content and type including origin and chemical composition	Risk characterization
153	Kaluzhskiy rural settlement, Pridorozhnoye town	1	1997	72	1200						
154	Privolnoye town	1	1997	56	1000						
155	Kalinovskiy rural settlement, Kalinova town	1	1998	40	2000						
156	Svoboda town	1		80	2350						
157	Volodarovka town	1	1998	40	1200						
158	Teimanovo town	1	1998	60	2080						
159	Mezhdurechye town	2	1998	200	500			100			
160	Ladushkin town, south-eastern outskirts of town. in the end of ul. Yesenina	5	No data	190 000	30 000	closed		10 000		The dumpsite is situated in 100 m from the Veleyka river and in 100 m from the urban residential buildings. The dumpsite is controlled, access roads are available	
161	Svetly town	5	No data	1 000 000	40 000	active	managed	43 000		No built bottom structures, no leachate collection	

# ANNEX III: GENERATION, TREATMENT AND STORAGE OF WASTE CLASSES I TO V (TONS) IN KALININGRAD IN 2008 BY ENTERPRISES AND OTHER ORGANISATIONS (ACCORDING TO 2-TP FORMS)

Class of HW	Amount of waste in the beginning of the year	Waste generated in the reported year	Waste utilized in the organization	Treated waste in the organization	Transferred to other organization for utilization or treatment	Tranferred to other organizations for storage	Waste at own facilities stored or disposed	Amount of waste by the end of the year
HC I total	27	137	0	0.002	137	0	32(stored)	56
Hg-cont wastes	0.002	0.002	0	0.002	0	0	0.002	0.002
Hg-lamps	25.164	10.5	0	0	10.281	0	31.402	55.142
Hg- thermometers	0.002	0.003	0	0	0.002	0	0.003	0.003
galvanic sludge	0.446	0.121	0	0	0	0	0.121	0.567
transformer oil cont. PCB	1.161	0	0	0	1.161	0	0	0
condensators with PCB	0	125.9	0	0	125.9	0	0	0
HC II total	31	100	3	0	103	2	19 (stored)	37
W from alcohol manufact.	1.45	2.55	0	0	0	0	2.55	4
W of chemical production	0	0.001	0	0	0	0	0.001	0.001
galvanic sludge	0.66	0.7	0	0	0	0	0.7	1.36
electrolytic used H2SO4	0.063	0.17	0.112	0	0	0	0.058	0.121
electrolytic H2SO4 sludge	0.045	0	0	0	0	0	0	0.045
Halogen cont.transformer. oil	1.755	0.792	2.547	0	0	0	0	0
hydraul oil containing halogens	1.5	0	0	0	0	0	0	1.5
halogen containing solvents and liquids	0.053	0.003	0	0	0	0	0.003	0.056
painting wastes	2.9	2.1	0	0	0	0	2.1	5
accumulator wastes	0	1.538	0	0	1.538	0	0	0
Pb accumulators, wastes and rejects	0	0.023	0	0	0	0	0.023	0.023
Pb accumulators, undrained, undamaged	22.255	92.43	0	0	101.353	1.885	13.79	25.124
HC III total	1021	10.334	7948	13.316	2.873	622	1.212	1.963
used impregnated railway poles	738.59	2.079	460.08	0	0	609	1,010	1,748
sand contaminated with > 15 % of fuel oil	46.8	262	46.8	0	233	10	10	10
sand contam. with > 15 % of other oils	0	1.5	1.5	0	0	0	85	0
filter and ads. masses with hazard w	0.524	4	0.075	4	0	0	0	0.5
mineral slams	0	66	66	0	0	0	0	0
wastes from oil and gas extraction	0	4.286	3250	1,036	0	0	0	0
copper junk	0.53	164	0.583	0	161	0	3	3
zinc junk	17.2	0	0	0	0	0	17.2	17.2
chemical waste	0	13	0	0.02	0	0	0	0
galvanic sludge	2.35	2.3	0	0	0	0	19	0
used motor oil	15.61	113	61	0	51	0.075	10	18
used industrial oil	13.33	39	17	0	28	0.68	5.3	7.2
other used oils	18.7	57	46	0.17	27.7	1.47	10.6	21
oil containing emulsions	4.3	27	1.2	2,681	27	0	0.3	3
oil containing sludge	0	1.7	1,053	9,534	0	0	0	0
oil contaminated rags and other material	17	82	16	58	5	0	9.4	16
solvent containing sludge	0	50	0	0	0	30	20	0
intact lead accumulators, drained	2.3	11.3	0	0	9	0	3.6	5
luminescent lamps and glass material	87	0	0	0	0	0	0	87
(details of only main HC III groups shown)								
HC IV	1,583,763	95,966	46,014	159	35,657	47	390,625	1,573,383
HC V	58,675	524,617	40,276	0	103,700	19	474,091	64,095
Total wastes	1,643,517	631,154	94,241	13,475	142,469	690	865,979	1,639,534

**ANNEX IVa: SUMMARY LIST OF COMPANIES DELIVERING SERVICES  
AND DEALING WITH WASTE STORAGE, RE-USE AND RECYCLING IN  
ST.PETERSBURG AND LENINGRAD REGION (BASED ON AVAILABLE DATA)**

*Selected based on the activities types  
from the list of licensed companies (years  
2006-2008)*

*(operations for own waste are not  
considered) and danger classes (1-3  
classes of industrial waste)*

*Marked in colors:*

*Yellow – oils*

*Green – mercury lamps/waste*

*Blue –accumulators*

N	Name in Russian	Name in English	Types of licensed activities in LO	Types of licensed activities in St.Pet.	Address and contacts in Russian
1	ООО "РодПолиТехЭко"	ООО "RosPollTechEco"	HW transportation and storage, industrial waste of 3-4 classes of danger	HS transportation and storage, industrial waste of 3-4 classes of danger	Tel. 275-03-20 Ленинградская обл., Всеволожский р-н, станция "Курпичинский завод" промзона
2	ОАО "Морской порт Санкт-Петербург"	ОАО "Sea Port of St.Petersburg"	HW collection and storage, industrial waste of 1-4 classes of danger	HS collection and storage, industrial waste of 1-4 classes of danger	Санкт-Петербург, наб Межевого канала, д.5 Tel. 251-02-38
3	ЗАО "Вуолы-Эко"	ЗАО "Vuoly-Eco"	HW collection, storage, sorting and utilization (landfill) of industrial waste of 3-4 classes of danger	HS collection, storage, sorting and utilization (landfill) of industrial waste of 3-4 classes of danger	Ленинградская обл., Всеволожский р-н, д. Варзолово, ул. Центральная, 1-А Tel. 115-35-49, (270)51141
4	ООО "Новый Свет -ЭКО"	ООО "Novy Svet-ECO"	HW collection of industrial waste of 1-4 classes of danger, and sorting and storage for industrial waste of 3-4 class of danger	HS collection of industrial waste of 1-4 classes of danger, and sorting and storage for industrial waste of 3-4 class of danger	Ленинградская обл., Гатчинский р-н, пос. Новый Свет Tel. (271)-68631
5	ЗАО "Резина"	ЗАО "Resin"	HW collection and storage, industrial waste of 1, 3 and 4 classes of danger	HS collection and storage, industrial waste of 1-4 classes of danger	Санкт-Петербург, наб. Обводного канала, д.136 Tel. 252-02-97
6	ЗАО "Компания ИНВЭКО"	ЗАО "Company INVEKO"	HW collection and storage, industrial waste of 1, 3 and 4 classes of danger	HS collection and storage, industrial waste of 1, 3 and 4 classes of danger	Санкт-Петербург, пр. Ю.Гагарина, д.1 Tel. 387-88-74
7	ОАО "Грузовое автотранспортное предприятие № 13"	ОАО "Cargo auto-transport enterprise N13"	HW collection and storage, industrial waste of 1-4 classes of danger	HS collection and storage, industrial waste of 1-4 classes of danger	Санкт-Петербург, ул. Маршала Говорова, д.37 Tel. 252-12-88
8	ОАО "Электросила"	ОАО "Electrosila"	Re-use of used oils of the 2 <sup>nd</sup> class of danger	Re-use of used oils of the 2 <sup>nd</sup> class of danger	Санкт-Петербург, Московский пр., д.139 Tel. 387-96-58
9	ГУП "Управление механизации ремонтно-строительных работ"	ГУП "Administration of mechanization of renovation and construction works"	HW collection and storage, industrial waste of 1-4 classes of danger	HS collection and storage, industrial waste of 1-4 classes of danger	Санкт-Петербург, Новолитовская ул., д.37А Tel. 245-05-09
10	ЗАО "ЮНЭП"	ЗАО "UNEP"	HW collection and processing (neutralization) of mercury lamps	HW collection and processing (neutralization) of mercury lamps	Ленинградская обл., г. Сосновый Бор, Промзона, ЭПК НПО "Радиовый институт им. В.Г. Хлопина" (812-69)26024
11	ОАО "Сланцевский завод "Полимер"	ОАО "Slantevsky plant "Polymer"	Storage and processing of old tires	Storage and processing of old tires	Ленинградская обл., г. Сланцы, ул. Дорожная, д.3-а Tel. 74-24546
12	СПб ГУДСП "Курортное"	SPbGUDSP "Kurortnoe"	Usage of waste oils (3 <sup>rd</sup> class)	Usage of waste oils (3 <sup>rd</sup> class)	Санкт-Петербург, г. Сестрорецк, ул. Инструментальщиков, д.3 Tel. 434-67-19
13	ООО "Энергосервисная компания Морского порта"	ООО "Energy-service company of the Sea port"	HW collection and storage, industrial waste of 1-4 classes of danger	HW collection and storage, industrial waste of 1-4 classes of danger	Санкт-Петербург, Межевой канал, д.5 Tel. 259-82-51
14	ЗАО "НПО "СевЗапПромЭкология"	ЗАО "NPO "Sev ZapPromEcology"	HW collection, storage and processing of industrial waste of 1-4 classes of danger including waste oils, oil products . mercury lamps etc.	HW collection, storage and processing of industrial waste of 1-4 classes of danger including waste oils, oil products, mercury lamps etc.	г.Санкт-Петербург, Малоохтинский пр., д.68 tel. 525-02-35
15	ЗАО "Викториал"	ЗАО "Victorial"	Usage of waste industrial oils (3 <sup>rd</sup> class)	Usage of waste industrial oils (3 <sup>rd</sup> class)	Санкт-Петербург, Комендантский пр., д.32, корп.53 Tel. 48-48-17



N	Name in Russian	Name in English	Types of licensed activities in LO	Types of licensed activities in St.Pet.	Address and contacts in Russian
16	ООО "Викинг"	ООО "Viking"	Usage of waste industrial oils (3 <sup>rd</sup> class)	Usage of waste industrial oils (3 <sup>rd</sup> class)	Санкт-Петербург, Масляный пер., д.8 tel. 252-62-02
17	ООО "Специализированный морской нефтеналивной порт "Приморск"	ООО "Specialized Sea Oil Port "Primorsk"	HW collection, storage, sorting and processing of industrial waste of 4 class of danger (oil products)	HW collection, storage, sorting and processing of industrial waste of 4 class of danger (oil products)	Ленинградская область, Выборгский р-н, г. Приморск Tel. 7878778
18	ООО "СКАТ"	ООО "SKAT"	HW collection and utilization of mercury lamps and other Hg-containing devices, 1 class of danger	HW collection and utilization of mercury lamps and other Hg-containing devices, 1 class of danger	Санкт-Петербург, Северный пр., д. 24, tel. 511-37-49
19	ООО "Оккervиль"	ООО "Okkerville"	HW collection and storage, industrial waste of 1-4 classes of danger	HS collection and storage, industrial waste of 1-4 classes of danger	Санкт-Петербург, Выборгская наб., д.55 Tel. 596-34-04
20	ООО "Экопром- Холдинг"	ООО "Ecoprom-holding"	HW collection, storage, use and processing of waste oils (2-4 class)	HW collection, storage, use and processing of waste oils (2-4 class)	Ленинградская обл., г. Выборг, ул. Физкультурная, д.17, офис 233 Tel. 278-27479
21	СПб ГУПП "Полигон "Красный Бор"	SPb GUPP "Krasny Bor"	HW collection, storage, and processing of industrial waste of 1-4 classes of danger	HW collection, storage, and processing of industrial waste of 1-4 classes of danger	Санкт-Петербург, Колпино-4, ул. Tel. 469-60-54
22	ООО "Экострой"	ООО "Ecstroy"	HW collection and storage, oil sludge of 2 class, soils and oil products of 3 <sup>rd</sup> class		Ленинградская обл., г. Всеволожск, Плоткина, д.19 Tel. 316-50-49
23	ОАО "Пушкинская автобаза "СПЕЦТРАНС"	ОАО "Pushkin auto-base "Spetstrans"	HW collection, storage, and sorting of industrial waste of 1-4 classes of danger	HW collection, storage, and sorting of industrial waste of 1-4 classes of danger	Санкт-Петербург, г. Пушкин, ул. Гусарская, 467-02-47
24	ОАО "Пирометр"	ОАО "Pyrometer"	HW collection and storage of mercury lamps and used oils (2 class)	HW collection and storage of mercury lamps and used oils (2 class)	Санкт-Петербург, ул. Большая Монетная, 238-72-80
25	ОАО "Фольгопрокатный завод"	ОАО "Foil-rolling plant"	HW processing and use of waste oils (3 class)	HW processing and use of waste oils (3 class)	Санкт-Петербург, ул. Перевозная, д.1, tel 114-86-06
26	ОАО "Завод "Красный Выборжец"	ОАО "Plant "Red Vyborzhets"	HW collection, storage and use of industrial waste of 1-4 classes of danger	HS collection, storage and use of industrial waste of 1-4 classes of danger	Санкт-Петербург, Свердловская наб., д.12 tel 541-12-12
27	СПб ГУП "Инженерный центр экологических работ"	SPb GUP "Engineering Center of environmental works"	HW collection, processing of mercury-containing waste, soils polluted by oil, oil-processing waste, sludge containing heavy metals, chemicals of 1-4 class of danger	HW collection, processing of mercury-containing waste, soils polluted by oil, oil-processing waste, sludge containing heavy metals, chemicals of 1-4 class of danger	Санкт-Петербург, 13-я линия В.О., д.22 321-71-78
28	ОАО "Автопарк № 6 "Спецтранс"	ОАО "Auto-park N6 "Spetstrans"	HW collection, storage and sorting of industrial waste (1-4 classes)	HW collection, storage and sorting of industrial waste (1-4 classes)	Санкт-Петербург, пр. Энергетиков, д.59 225-16-00
29	ООО "Эктон"	ООО "Ecotone"	HW waste – HG lamps processing/decontamination	HW waste – HG lamps processing/decontamination	Санкт-Петербург, Выборгское шоссе, д. 554-93-31
30	ОАО Автотранспортное предприятие № 15 (ОАО АТП-15)	ОАО "Auto-transport enterprise N 15"	HW collection and storage of mercury lamps (3-4 class)	HW collection and storage of mercury lamps (3-4 class)	Санкт-Петербург, ул. Автомобильная, д.8 158-06-00
31	ЗАО "Международный деловой центр "Нептун"	ЗАО "International business center "Neptune"	HW collection and storage of industrial waste of 1-4 class of danger	HW collection and storage of industrial waste of 1-4 class of danger	Санкт-Петербург, наб. Обводного канала, д. 93А 324-46-00
32	ООО "Морттехсервис"	ООО "Mortechservice"	HW collection, storage and processing of used oils (2 class) and waste waters with oils (4 class)	HW collection, storage and processing of used oils (2 class) and waste waters with oils (4 class)	Санкт-Петербург, В.О. 11-я линия, д. 56А, 329-69-60
33	ЗАО "Новые технологии"	ЗАО "New technologies"	HW collection and storage of used accumulators (3 class of danger)	HW collection and storage of used accumulators (3 class of danger)	Санкт-Петербург, ул. Емельянова, д.10 346-61-42

N	Name in Russian	Name in English	Types of licensed activities in LO	Types of licensed activities in St.Pet.	Address and contacts in Russian
34	ОАО "Светлана"	ZAO "Sveltana"	HW waste – HG lamps and other industrial waste (1-4 class) collection, storage, use and processing/ decontamination	HW waste – HG lamps and other industrial waste (1-4 class) collection, storage, use and processing/ decontamination	Санкт-Петербург, пр. Энгельса, д.27 554-91-21
35	ЗАО "Орлан - Эко"	ZAO "Orlan-Eco"	HW collection, storage and decontamination of oil-containing waste and waters	HW collection, storage and decontamination of oil-containing waste and waters	Санкт-Петербург; ул. Моховая, д.31, пом.22Н
36	ЗАО "Экопром"	ZAO "Ecoprom"	HW collection and decontamination of industrial waste of 2-4 class of danger	HW collection and decontamination of industrial waste of 2-4 class of danger	Санкт-Петербург, Грузовой проезд, д.13 172-31-92
37	ЗАО "Экопром-Плюс"	ZAO "Ecoprom-Plus"	HW collection, decontamination and storage of oil-containing waste of 2-4 class of danger	HW collection, decontamination and storage of oil-containing waste of 2-4 class of danger	Ленинградская обл., г. Шлиссельбург 172-31-92
38	ООО "ПТК-Эколог"	ООО "PTK-Ecolog"	HW collection, use and storage of oil-containing waste (3 class)	HW collection, use and storage of oil-containing waste (3 class)	Санкт-Петербург, Пискаревский пр., д.125 545-46-50
39	ООО "ПТК- Терминал"	ООО "PTK-Terminal"	HW decontamination – used oil products (3 class)	HW decontamination – used oil products (3 class)	Санкт-Петербург; Пискаревский пр., 125 545-46-57
40	ООО "Гравит"	ООО "Gravit"	HW collection, use, decontamination and storage of resin and oil-containing waste, polluted soils	HW collection, use, decontamination and storage of resin and oil-containing waste, polluted soils	Санкт-Петербург, ул. Декабристов, д.43-45, лит.А, пом.2Н, 346-45-22
41	ЗАО "Железобетонные конструкции и детали"	ZAO "Iron-betony construction details "	HW collection and use of industrial waste (1-4 class of danger)	HW collection and use of industrial waste (1-4 class of danger)	Санкт-Петербург, ул. И.Черных, 16 252-08-54
42	ОАО "Тонар"	ОАО "Tonar"	HW collection, use and decontamination of liquid waste from perfume and cosmetic industries, plus alcohol-containing production		Ленинградская обл., Всеволожский р-н, пос. Кузьмоловский, Опытный завод "Прикладная химия"
43	ФГУП РНЦ "Прикладная химия"	FGUP RHTs "Applied chemistry"	HW collection and decontamination (incineration) of liquid and solid medical waste and drugs with expired life-time		Санкт-Петербург, 238-90-04
44	ООО "ЭкоПромСервис"	ООО "EcoPromService"	HW transportation of industrial waste (1-4 class)	HW utilization, storage of oil-containing waste and industrial waste (1-4 class)	г. Санкт - Петербург, Фаянсовая ул., д.24, лит. Б
45	ЗАО "Санкт-Петербургский Центр Аккумуляторных Батарей"	ZAO "St.Petersburg Center of accumulators"	Transport of used accumulators	Storage of used accumulators	г. Санкт Петербург; Шпалерная ул., д. 36 325-34-68
46	ГУП "Научно - производственное объединение "Радиовый институт им. В.Г. Хлопина"	GUP "Scientific-production union "Radium Institute names by V.G. Khlopin"	Storage of used Hg lamps and waste from Hg decontamination process		г. Санкт - Петербург, 2-й Мушинский пр., д.28 (269)24238
47	ООО "Промэкология"	ООО "Promecologia"	Utilization (sorting and disassembling) of used accumulators		Ленинградская обл., Гатчинский р-н, дер. Малые Колпаны, ул. Кооперативная, д.1 (271)20487
48	ООО "Балтийские магистральные нефтепроводы"	ООО "Baltic main oil pipelines"	Storage and incineration of waste from oil-terminals in Primorsk (own incinerator – IN-50.1)	Transportation of waste from oil-terminals in Primorsk	Ленинградская обл., Выборгский р-н, г. Приморск 275-11-14

*Companies highlighted with **bold** letters hold licenses for collection, utilization, neutralization, transportation and disposal of hazardous waste. Other companies have not got such licenses.*

#	Description of waste	Class of hazard	Company	Address	Telephone
1	Instruments and waste containing mercury	I	OOO Sintez Ltd	240 A. Nevskogo st., Kaliningrad	466-285 466-876 (f)
2	Used accumulator batteries	II	OOO Sintez Ltd	240 A. Nevskogo st., Kaliningrad	466-285 466-876 (f)
3	Waste containing oil (oil, water containing fuel oil, surface film from oil catchers, etc.)	III	OOO Kaliningradvtormet	35 Pobedy pr., Kaliningrad (registered address) 49a Kamskaya st., Kaliningrad (actual address)	210-774
			OOO NImEk	8 Moskovskaya st., Nesterov	
			OOO Kaliningradnefteprodukt	80 Portovaya st., Kaliningrad (Kaliningrad Petroleum Depot) 22b Komsomolskaya st., Kaliningrad	93-45-11 65-56-68
			FSUE Kaliningrad Fishery Sea Port	1 5th Prichalnaya st., Kaliningrad	69-64-88 63-20-90 (f)
			RSUE ES00	4 Barnaulskaya st., Kaliningrad Kruglovo village, Zelenogradsky District, Kaliningrad Region	53-13-15
			OOO Equivalent	5 Potiomkina st., Kaliningrad	530-392 t/f
			OOO Utilnefteprodukt	2 Dnepropetrovskaya st., Kaliningrad	
			OOO Balt-Shitok*	57-1 Narvskaya st., Kaliningrad	93-10-42
			OOO Cracking	108/13 Chekistov st., Kaliningrad	
			Experimental Plant "Metallist_Remputmash"	2a Klevskaya st., Sovetsk	(840141) 6-23-09
			OOO Scientific and Manufacturing Company "Biolant" (research in the sphere of microbiological utilization of oil and grease waste in settling tanks at treatment plants)	99A Yaltinskaya st., Kaliningrad	46-62-75
			OOO PrusOilShab	43 Ozernaya st., Kaliningrad	98-62-57, 77-02-88
4	Mud from cleaning of oil containers	III	OOO Polex-Eco	Generala Pavlova st., Kaliningrad	76-15-40 53-93-76 (f)
			OOO Equivalent (cleaning)	5 Potiomkina st., Kaliningrad	530-392 t/f
			OOO Baltinexim (cleaning)	3 Kaliningradskoye highway, Gurjevsk town, Kaliningrad Region (registered address) 1 Epronovskaya st., Kaliningrad (actual address)	66-91-88 66-91-90
			OOO Control – N (cleaning)	34 Sovetskaya st., apt. 78, Svetly town, Kaliningrad Region (registered address) 4 Vodolazny lane, Baltijsk town, Kaliningrad Region (actual address)	
			OOO Promyshlennaya Izoliatsiya (cleaning)	39 Chirkovskogo st., Kaliningrad	
			OOO Transnefteprodukt (cleaning)	4 Tretyakovskaya st., Kaliningrad	91-36-22
			Individual Entrepreneur T.F.Savchenko	53-30 Belinskogo st., Kaliningrad	33-16-23
5	Wiping material polluted with oil	III	FSUE Kaliningrad Fishery Sea Port (mud utilization)	80 Portovaya st., Kaliningrad (Kaliningrad Petroleum Depot) 22b Komsomolskaya st., Kaliningrad	93-45-11
			RSUE ES00	4 Barnaulskaya st., Kaliningrad Kruglovo village, Zelenograd District, Kaliningrad Region	53-13-15
6	Automobile filters	III			

7	MSW	IV	MUE Chistota (landfill in A.Kosmodemjanskogo village)	59 Pionerskaya st., Kaliningrad	46-88-11 46-90-37 46-33-81 34-96-30
			RSUE ESOU (landfill in Kruglovo village)	4 Barnaulskaya st., Kaliningrad Kruglovo village, Zelenograd District, Kaliningrad Region	53-13-15
			MKP Blagoustrojstvo i Ekologija	8 Transporthaya st., Kaliningrad	64-85-52
			OOO Gabarit	39-5 Belbejskaya st., Kaliningrad 43 Ozernaya st., Kaliningrad	38-56-07 77-67-24
			Individual Entrepreneur Vladimir Nikolaevich Ilyin	18 Baltijskaya st., Kaliningrad	708-330 708-327
			Individual Entrepreneur Alla Rafailovna Ilyina	18 Baltijskaya st., Kaliningrad	706-330 986-330
			Individual Entrepreneur Vladislava Vladimirovna Ilyina	18 Baltijskaya st., Kaliningrad	986-330 986-364
			Individual Entrepreneur Asya Nikolaevna Rakcheeva	18 Baltijskaya st., Kaliningrad	986-330 986-364
			OOO Frankonia-39	38-1 Kostikova st., Kaliningrad (registered address) 49 Sovetsky pr., Kaliningrad (actual address)	57-18-87
			OOO Tsentr Zhylischnykh Intsyativ - Servis	66 Yalinskaya st., Kaliningrad	
			MUE Raduga (landfill in Einiki village, Gvardejsky district)	17 Telmana st., Gvardejsk Kaliningrad	
			Individual Entrepreneur D.A.Melnikov	49 Sovetsky pr., Kaliningrad	57-18-87
			OOO Tsentralnaya Upravljajuschaja Kompanija	11a Pobedy st., Gusev	
			OOO Upravljajuschaja Kompanija	59 Pobedy st., Bargationovsk town, Bagrationovsk District, Kalinin- grad Region	840156-32210
			OOO Roskemping (landfill in Kornevo village, Bagrationovsk UO)		
			MUE ZheU of Zelenogradsky District Municipality	8 Kurortny pr., Zelenogradsk	840150-32234 840150-31379
			MUE Svetlovskoye Blagoustrojstvo of Svetlovsky Urban Okrug Municipality	47 Sovetsaya st., Svetly	840152-31489 840152-32001
			MUE ZhKH Communalnik (landfill in Ilyichevka village, Gurjevsk UO)	5 Gurjevskaya st., M.Isakovo village, Gurjevsk District, Kaliningrad Region	46-12-64 (l), 51-57-59 (f)
			MUE Kristall (landfill of Cherniakhovsk town)	19 Gagarina st., Cherniakhovsk	840141-32848 840141-32431 840141-34995
			MUE for Area Improvement, Rehabilitation and Construction Works (landfill of Polesk town)	3 Rabochaya st., Polesk	
			MUE Chistota, Mamonovo town (landfill of Mamonovo town)	2 Sovetskaya st., Mamonovo Town, Mamonovo Urban Okrug, Kaliningrad Region	
			MUE ZhKH of Bagrationovsk town (landfill of Bagrationovsk town)	41a Pogranichnaya st., Bagrationovsk	
			MUE ZhKH of Nivenskoye village (Nivenskoye village landfill)	Nivenskoye village, Bagrationovsk District, Kaliningrad Region	
			MP Municipal Service and Operations Complex of Ladushkinsky Urban Okrug Municipality (Ladushkin town landfill – closed, under recultivation)	2 Pervomajskaya st., Ladushkin Town, Bagrationovsk District, Kaliningrad Region	840156-66224

8	Waste (sludge) from cess pits and household wastewater	IV	MUE Chistota (collection of liquid waste by cesspool truck)	59 Pionerskaya st., Kaliningrad	46-88-11 46-90-37 46-33-81 34-96-30
			OOO RosEko (collection of liquid waste by cesspool truck)	58a M.Borzova st., Kaliningrad	910-907
			MUE KH Vodokanal (place and conditions for discharge of household wastewater)	12 Komsomolskaya st., Kaliningrad	
			Individual Entrepreneur N.V.Mikheev	7v Zheleznodorozhnaya st., Kaliningrad	39-04-74
			MUE for Area Emprovement, Rehabilitation and Construction Works (place and conditions for discharge of household wastewater)	3 Rabochaya st., Polesk	
9	Tires	IV	RSUE ES00	4 Barnaulskaya st., Kaliningrad Kruglovo village, Zelenograd District, Kaliningrad Region	53-13-15
			OOO Eco Shina	4 Pobedy sq., Kaliningrad 2a Zalivnaya st., Vzmorje village, Svetlanovsk UO, Kaliningrad Region	
10	Waste salts (used fixing agents)	IV	OOO Baltjisky Torgovo-Promyshlenny Dom "Resursy Severa"	66 Yalinskaya st., Kaliningrad	89114893150 89114868446
11	Scrap metal	V	OOO Argentum Plius	Frunze st., Kaliningrad	595-695 t/f 89062387892
			OOO BaltVormetServis	PGT Sovkhoznoye, Kaliningrad	
			OOO BaltVtorResurs	12 Stanochhnaya st., Kaliningrad	
			OOO Bravo BVR	12 Stanochhnaya st., Kaliningrad	
			OOO KaliningradVtormet	35 Pobedy pr., Kaliningrad (registered address) 49a Kamskaya st., Kaliningrad (actual address)	21-07-74 96-84-51
			OOO KaliningradVtortsvetmet	189 A. Nevskogo st., Kaliningrad (registered address) 15 Matrosova st., Kaliningrad (actual address)	53-85-46 t/f
			OOO RVTs & Co	30 Portovaya st., Kaliningrad	47-16-46 64-17-65
			OOO Balt-Metall	2-4 Mendeleeva st., Gusev	55-75-58
			OOO MetallStil	54 Suvorova st., Kaliningrad	
			OOO Vneshtorgmetall	14-401 Sergeeva st., Kaliningrad	99-11-31 59-51-14
12	Scrap paper	V	OOO Gelios	PGT Sovkhoznoye, Kaliningrad (registered address) 54 Malaya Sadovaya st., Pravdinsk (actual address)	39-92-28 99-32-28
			OOO Tekhnoprospect	3 Verkhneozernaya st., Kaliningrad	
			OOO ECO-VTOR	10 Stroitelny lane, Gurjevs (registered address) 1v Saturskaya st., Vasilkovo village, Kaliningrad Region (actual address)	59-71-74
			OOO Gruppa 109	10A Mendeleeva st., Kaliningrad	55-72-58
			ZAO KaliningradVtorresursy	1 Novinskaya st., Kaliningrad	63-23-52 63-23-57 63-22-94 (f)
			OOO Ecoformula	12 Goncharova st., Sovetsk	
			OOO Regionalnaja Ecologicheskaja Kompanija	5-8 Kaliningradskoye highway, Sovetsk 2 Lunacharskogo st., Sovetsk (actual address)	8-(40161)- 3-71-88 Менеджер 89052425232
			RSUE ES00	4 Barnaulskaya st., Kaliningrad Kruglovo village, Zelenogradsk District, Kaliningrad Region	53-13-15
			OOO Kartonpak Plus	75 Sudostroitel'naya st., Kaliningrad	77-88-50
			OOO ZapadResurs	1 Shaturskaya st., Vasilkovo village, Gurjevs District, Kaliningrad Region	59-71-99
			OOO Sovetskaya Bumaga	Sovetsk Town	
			OOO Ecologia Regiona	5-8 Kaliningradskoye highway, Sovetsk (registered address) 2 Lunacharskogo st., Sovetsk (actual address)	840161-37188
			Individual Entrepreneur S.V.Kabytchkin	4 Rechnaya st., Sovetsk	



13	Polymer materials	V	ZAO Kaliningradvtorresursy	1 Novinskaya st., Kaliningrad	63-23-52 63-22-94 (f)
				OOO Baltpolymer SNAB (crushed polystyrene, industrial polymer waste)	55-75-24 55-72-13 t/f
				OOO Regionalnaya Ecologicheskaya Kompaniya	8-(40161)- 3-71-88 менеджер 89052425232
14	Biological waste		MKP Sluzhba Zashchity Zhivotnykh	45 Tihoretskaya st., Kaliningrad	63-09-97
15	Healthcare waste			OOO Baltijskaya Krovlya Plus (disposable syringes)	56-31-01 t/f
				Individual Entrepreneur A.B. Hlinskaya (disposable syringes)	686-553 t/f 682-311
				OOO Eco Gruppa	
				Municipal Healthcare Institution "City Multifield Hospital" (biological waste, syringe needles, dressing material)	64-78-21 64-79-53
				Regional Healthcare Institution "Family Planning and Reproduction Centre" (disposable syringes with needles)	
				Filial OOO "SKO" Kaliningradprofkurtort" (peloid)	(840153) 2-11-73

\* - license expired on 08.10.2008.

# **ANNEX V: LEGAL ANALYSIS**

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## ABBREVIATIONS

<b>ADR</b>	European Agreement concerning the international carriage of Dangerous goods by road
<b>BAT</b>	Best Available Technology
<b>EU</b>	European Union
<b>GOST</b>	Technical Standard
<b>HW</b>	Hazardous Waste
<b>HWM</b>	Hazardous Waste Management
<b>MSW</b>	Municipal Solid Waste
<b>RF</b>	Russian Federation
<b>SanPin</b>	Sanitary Rules

## 1 EXECUTIVE SUMMARY

This legal assessment is part of the BaltHazAR project – Baltic Hazardous Waste and Agricultural Releases Reduction project financed by European Union. The overall objective of the hazardous waste component of the BaltHazAR project is to protect the Baltic Sea from hazardous and agricultural waste loading. The hazardous waste component includes two elements, namely “Inventories of hazardous waste sites” and “Hazardous waste management regime”.

This report contains a general description of the Russian hazardous waste legislation, and identification of gaps that may cause inappropriate hazardous waste management.

### Waste legislation in Russia

The central element for legal regulation of waste management is the federal law “On Production and Consumption Waste.” Various provisions concerning waste management are also contained in environmental, sanitary, urban planning, land, civil and other laws. The Russian classification divides waste into five classes from 1 (extremely hazardous) to 5 (practically non-hazardous). In most cases, regulations relate to “waste” in general with differentiation by classes. Regulation of hazardous waste management may be performed by federal legislation only. There is no specific legislation on hazardous waste management. The principal aspects of the hazardous waste management system are determined by about 40 laws, bylaws and normative-technical documents on federal level. In the new version of the Federal law on waste, which came into effect on June 30, 2009, the definition of hazardous waste was removed and the term was replaced with *class I-IV waste*.

### Subjects of the waste management system

Waste management is a subject of environmental (performed by Rosprirodnadzor), sanitary (performed by Rospotrebnadzor) and production control. For enterprises, there are reporting forms designed to control the entire lifecycle of waste, to encourage reduction of waste generation and to provide for charging of environmental fees. Transportation companies and companies engaged in waste disposal (including incineration) and burial are subject to licensing, and projects of disposal plants and landfills are subject to environmental expert review (performed by Rostekhnadzor). Control over hazardous waste disposing plants and landfills is performed by the federal authority. Regional authorities may establish and support the hazardous waste management utilities in the region in the framework of environment protection programs. It is the responsibility of the local authorities to organise collection, transportation, treatment and recycling of indus-

trial and household waste. However, in St Petersburg and in Moscow these powers rest with the regional governments.

### Gaps in regulation

The identified gaps in the hazardous waste management (HWM) regulation can be divided into several categories:

- legal gaps (inaccurate wordings, absence of legal acts stipulated by applicable law, etc.);
- organizational-legal gaps (absence of authority and duties/responsibilities);
- difficulties in law enforcement practices, caused by legal gaps, economic reasons etc.

The waste classification concept and terminology are complicated as there are two separate classification systems for dividing hazardous wastes into classes of hazard based on the level of adverse impacts either on the environment or on human health. There are no requirements to collect separately wastes with hazardous properties from households and to deliver them to adequate treatment or disposal. Gaps concerning industrial companies are related to economic motives for violation of law, inefficiency of control and problems with waste recirculation. Transportation and burial seem vulnerable stages for violation of law due to insufficient control and difficulties in detecting and investigating environmental crimes. The normative-technical documentation on landfill and processing plant construction is quite detailed. The differences between the actually built facilities and the design project documentation are a problem of law enforcement rather than of legislation.

The somewhat unclear and changing responsibilities of the authorities contribute to enforcement problems. The authorities do not always have the resources needed to control and inspect enterprises producing or managing hazardous wastes.

The identified major differences as compared to EU regulatory principles are listed below:

- classification of waste to several classes of hazard or toxicity;
- no unique definition of hazardous waste and specific requirements for their management;
- no producer responsibility for obsolete products;
- no requirements to collect separately hazardous wastes of different classes (except for medical waste). The fee is higher for the more dangerous classes and it is assumed that waste producers are stimulated not to mix wastes of different classes to avoid increase of disposal fees.
- separate collection of household waste with hazardous properties is not required;

- landfills are classified in a different way from EU. In Russia they are classified as municipal solid waste landfills and hazardous waste landfills. Hazardous waste landfills may be specialized into classes I-II, or III-IV or other combination. In EU there are three types of landfills: for hazardous waste, non-hazardous waste and inert waste;
- different technical requirements for landfill bottom and surface structures, monitoring, and closure.

## 2 INTRODUCTION

This legal assessment is part of the BaltHazAR project – Baltic Hazardous Waste and Agricultural Releases Reduction project financed by European Union. The overall objective of the hazardous waste component of the BaltHazAr project is to protect the Baltic Sea from hazardous and agricultural waste loading. The hazardous waste component includes two elements, namely “Inventories of hazardous waste sites” and “Hazardous waste management regime”.

This legal assessment aims at giving an overview of the existing hazardous waste management regime in the Russian Federation giving a general picture of the legislation and gaps hindering environmentally sound hazardous waste management practices.

### 3 GENERAL DESCRIPTION OF LEGISLATION ON HAZARDOUS WASTE MANAGEMENT IN THE RUSSIAN FEDERATION

#### 3.1 General

In the Federal legislation the following terms are used in different relevant contexts: waste, hazardous waste, production and consumption waste, toxic waste, domestic waste, industrial waste, etc. Hazardous substances legislation is separate.

In June 2009 Kodex, the Russian electronic legal document system, offers 3,584 legal acts for a Waste enquiry, 1,539 for Hazardous Waste, 788 for Toxic Waste, and 1,514 for Domestic Waste. These include 1) Federal Laws, 2) bylaws, and 3) normative-technical documents.

Most of these regulatory documents refer to “waste” in general. However, the article 5 of the Federal Law “On Environmental Protection” stipulates that **setting the order of hazardous waste management is an exclusive competency of federal authorities**. Therefore, this analysis of legal control is focused on the Federal Law.

The Federal legislation is based on a principle of a hierarchy, where inferior legal acts must not contradict with superior ones. So, the sequence of Russian legal documents is the following (starting from the highest level):

- 1) Federal laws;
- 2) Decrees of the President of Russia;
- 3) Orders of the Russian Government;
- 4) Legal acts of Federal ministries and agencies;
- 5) Normative-technical and instructive-methodical documents;

There is also “specific” legislation, which has priority in the area of regulation. Due to this, various aspects of waste management are governed by the waste law, environmental law, sanitary-epidemiological law, urban planning law, civil law, etc.

#### 3.2 Specific legislation on hazardous waste treatment

##### The Federal Law “On Production and Consumption Waste”

This piece of legislation has the status of a “specific” law in the area of waste management, and it sets:

- 1) the legal definitions;
- 2) the legal basis for production and consumption waste management aimed at prevention of an adverse

effect on human health and the environment (*here the environmental protection legislation is applied*);

3) the legal basics of using waste for commercial purposes i.e. as raw materials (*the civil, tax, and antimonopoly law is applied*).

According to the hierarchy principle, other legal acts of federal, regional, and municipal authorities in the area of waste management must correspond to the Federal Law “On Production and Consumption Waste.” Moreover, the Law on Environmental Protection and other general laws may not contradict with law specifically regulating waste treatment issues.

The law determines that **legal regulation** of production and consumption waste management and state control in this area is a responsibility of state authorities of the Russian Federation.

The law establishes special procedures for hazardous waste treatment: certification, licensing of hazardous waste treatment, requirements to professional qualifications of staff, handling requirements, prohibition of import for burial and deactivation, and special control of transboundary movement (Basel Convention).

The law stipulates that **business economical entities** (i.e. enterprises) are responsible to separate hazardous waste from the general waste and treat it safely (see 4.2.1).

It is prohibited to bury any waste within inhabited areas, forests, resorts, healthcare and recreation areas, as well as water protection zones and groundwater catchments used for drinking and household water supply. It is also prohibited to place it in mineral resource deposits and mining areas, if there is a risk of pollution of or risks to the safety of mining operations (clause 5, article 12).

The provisions of the Federal Law “On Production and Consumption Waste” and other Federal laws have been implemented in a number of state standards (GOSTs) in waste treatment. These GOSTs also comply with the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal harmonizing the Russian and international legislation (see GOSTs list in the appendix).

The abovementioned GOSTs apply to any production and consumption waste that is generated, stored, and consumed in the Russian Federation including waste resulting from transboundary movements. Their provisions are also included in all documentation for any waste at all the stages of its life cycle.



### 3.3 Environmental protection legislation regarding hazardous waste management

#### 1. The federal Law “On Environmental Protection”

- is based on the Russian Constitution and used as the “general” law for environmental protection, whereas all other legal acts in this area should comply with its provisions.
- sets forth basic responsibilities of state authorities of the Russian Federation, state authorities of subjects of the Russian Federation (oblasts), and the authorities of the local self-administration (municipalities) in environmental protection.
- determines basic requirements in the field of nature use, environmental protection, and environmental safety in the waste sector including hazardous and radioactive waste.

According to this law “collection, use<sup>1</sup>, deactivation<sup>2</sup>, transportation, handling, and burial of production and consumption waste shall be regulated”.

Under this law the following activities are prohibited:

- Dumping of production and consumption waste, including hazardous waste (not specified explicitly), into surface and underground water objects, water catchments, in sub-soils/bedrocks and on soils;
- Disposal of hazardous waste in areas adjoining to urban and rural settlements, in forests and parks, resorts, healthcare and recreation areas, nearby the pathways of animals migration, close to fish spawning areas and in other places where such disposal could create a harm to the environment, natural ecological systems and human health;
- Burial of a hazardous waste on water catchments of groundwater used for water supply, balneological (spa) purposes, or extraction of valuable mineral resources;
- Import of hazardous waste to the Russian Federation aimed at their burial and deactivation (item 51 of the article 2).

Buildings, structures, and other facilities must be designed using resource-saving, low-waste, waste-free, and other best available technologies; means of waste disposal are obligatory in all such facilities (clause 1 of the article 36).

It is prohibited to commission buildings, structures, and other facilities, if they are not equipped with technical means and technologies for deactivation and safe disposal of production and consumption

waste; these means/technologies should comply with all relevant environmental protection requirements. It is also prohibited to commission any facilities without proper environmental pollution control means or before environmental protection measures are completed (clause 2 of the article 38).

Individuals and legal entities, responsible for buildings/constructions maintenance, shall ensure full compliance with environmental quality standards using technical means and technologies for disinfection and safe disposal of production and consumption waste (clause 2 of the article 39).

#### 2. Other Federal laws for environmental protection

**The Federal Law “On Environmental Review”** stipulates that project documentation for facilities aimed at disposal and deactivation of waste (hazard class I-V) is subject to a federal-level environmental review<sup>3</sup>.

**The Water Code of the Russian Federation** sets forth requirements on protection of surface water bodies against pollution by hazardous waste and determines responsibilities of state authorities in water protection area.

The following activities are prohibited:

- Disposal and burial of production and consumption waste in water bodies (hazard class is not mentioned) including vessels and other floating means (their parts and mechanisms) that are out of operation (clause 1 of the article 56)
- Pollution and contamination of wetlands (clause 1 of the article 57) as well as glaciers and snowfields (clause 1 of the article 58) with production and consumption waste, oil products, hazardous chemicals and other harmful substances.

Once more it is confirmed that production and consumption waste may not be placed at groundwater catchments used/or might be used for drinking or household water supply (clause 2 of the article 59), or within the boundaries of water protection zones (clause 15 of the article 65).

<sup>1</sup> Waste use - application of waste for making goods (products) (in practice recycling), performance of services or for energy generation.

<sup>2</sup> Waste deactivation – waste management including incineration and disinfection at specialized plants for prevention of harmful impact on human health and the environment (Federal Law on Waste, article 1).

<sup>3</sup> However, the decision to permit a site for waste disposal and waste processing facilities is by Rospotrebnadzor decision only and does not require environmental review.

**The Federal Law “On protection of atmospheric air”** prohibits storage, dumping and deactivation of waste on the settlement territory as well as incineration without special incinerators, permitted according to the rules, issued by environmental authorities. Legal entities must ensure timely transportation of waste to landfills. Storage sites and landfills should be approved by environmental authorities.

### **3. Environmental protection bylaws of the Russian Federation regarding production and consumption waste**

The environmental control in the hazardous waste management area is performed by the Federal Service for Supervision in Nature Use and Environment (Rosprirodnadzor)<sup>4</sup>.

The state cadastre of waste and governmental registration in waste treatment, certification of hazardous waste management, approval of waste generation and disposal limits, and licensing is performed by the Federal Service for Environmental, Technological, and Nuclear Supervision (Rostekhnadzor)<sup>5</sup>.

State control over compliance with the law on sanitary well-being of the population is a responsibility of the Federal Service for Supervision in Protection of Consumer Rights and Human Wellbeing (Rospotrebnadzor)<sup>6</sup>.

The responsibilities and competency of each state authority are determined by an individual statute adopted by the order of Russian Government.

#### **GOST R 17.0.0.06-2000 Nature Protection. Environmental Passport of a Nature User. General Provisions. Sample Forms.**

This Standard sets forth general provisions for the structure, content, form, and completion of sample forms of an Environmental Passport of a Nature User. Such passport is recommended to be designed and maintained by all legal entities regardless of their form of ownership if they are engaged in business operations or other activities which may cause a negative impact on the environment in the Russian Federation.

The Environmental Passport of a Nature User must specify information on hazardous waste generated by the company.

### **3.4 Sanitary legislation in hazardous waste treatment sector**

#### **1. The Federal Law “On Sanitary and Epidemiologic Well-being of the Population”**

The law requires the establishment of an operational

state waste register (article 5) covering waste which might be potentially hazardous for humans. However, the legal consequences of including any waste in such a register are unclear from the law. The law states only that sanitary inspectors may prohibit import of waste not included into the register into Russia. No special legal acts for regulating such register and its consequences have been designed so far.

The requirements of the abovementioned laws on licensing and safety of the methods for collection, use, deactivation, handling, and disposal of waste are repeated in this law. A compulsory condition for getting a license for such activity is the document providing a sanitary-epidemiological conclusion on compliance of the buildings, structures, equipment, and other property to be used in hazardous waste management process to the sanitary regulations (clause 2 of the article 40).

State sanitary-epidemiological norms legislation has provisions including the need for comprehensive research, analysis of international experience, and prognosis.

### **2. Bylaws of the Russian Federation in sanitary legislation**

These bylaws determine:

- the size of sanitary protected areas around waste dumps and processing plants (Order of the Chief Sanitary Inspector of Russia from 25.09.2007 N 74 “On Enactment of the New Edition of Sanitary and Epidemiological Rules and Norms, SanPiN 2.2.1/2.1.1.1200-03 “Sanitary Protection Zones and Sanitary Classification of Enterprises, Structures, and Other Facilities.”)
- requirements for establishment and maintenance of Municipal Solid Waste landfills (Order of the Chief Sanitary Inspector of Russia from 30.05.2001 N 16 “On Enactment of Sanitary Rules “Sanitary Rules (SP) of 30.05.2001 N 2.1.7.1038-01 “Hygienic Requirements to Organization and Maintenance of Burial Grounds for Municipal Solid Waste”)

<sup>4</sup> Statute on the Federal Service for Supervision in Nature Use and Environment (Russian Government Order of 30.07.2004 N 400 (with subsequent amendments and supplements).

<sup>5</sup> Statute on the Federal Service for Environmental, Technological, and Nuclear Supervision (Russian Government Order of 30.07.2004 N 401 (with subsequent amendments and supplements).

<sup>6</sup> Statute on the Federal Service for Supervision in Protection of Consumer Rights and Human Wellbeing (Russian Government Order of 30.06.2004 N 322).

- requirements to location, organization, technology, operation mode, and reclamation for the areas of use, deactivation, and burial of waste including hazardous waste (Order of the Chief Sanitary Inspector of Russia of April 30, 2003 N 80, "On Enactment of Sanitary-epidemiological Rules and Norms, SanPiN 2.1.7.1322-03")

- order of storage, transportation, burial and disposal of (toxic) industrial waste (SanPiN 2.1.7-95).

### **3.5 Other federal legislation for hazardous waste management**

**The Urban Planning Code of the Russian Federation (GrK RF)** determines the placement and construction of landfills and processing plans including requirements on research and order of state expert examination of the project. Construction norms and rules are a part of the urban planning legislation.

**The Land Code of the Russian Federation** stipulates that the legal deals with the lands contaminated with hazardous waste is restricted, and directs disciplinary liability for officials found to be guilty in land contamination resulting from waste.

**The Federal Law "On Licensing of Certain Types of Activity"** stipulates that the business of collection, use, deactivation, transportation, and disposal of hazardous waste shall be licensed.

The order of licensing is determined by the Statute on the licensing of collection, use, deactivation, handling, and disposal of hazardous waste (Russian Government Order from 26.08.2006 N 524 with amendments of 15.06.2009). The law also clarifies responsibilities of licensing authorities and licensees.

**The Federal Law "On Technical Regulation"** lists waste disposal as one of the priority problems for design of national regulatory standards.

The laws mentioned above set forth the responsibilities of state authorities of the Russian Federation, state authorities of subjects of the Russian Federation, and local self-administration bodies in the respective areas.

**The Administrative Offense Code of the Russian Federation (KoAP RF)** stipulates administrative liability of state authorities of the Russian Federation, state authorities of subjects of the Russian Federation, and local self-administration bodies and their officials, public organizations, and individuals for incompliance with requirements towards waste management including other hazardous substances.

**The Criminal Code of the Russian Federation** stipulates criminal liability for incompliance with the

rules of hazardous substance management and waste treatment.

**The Civil Code of the Russian Federation** stipulates legal control of property interests of waste owners and determines the order of compensation of damages incurred by violation of waste management legislation.

## 4 ASSESSMENT OF HAZARDOUS WASTE LEGISLATION IN RUSSIA

### 4.1 Hazardous waste classification according to the Russian legislation

In the national legislation there are several classifications for hazardous waste, based on environmental, safety and health properties.

First of all, the general idea of the Federal Law on Waste is that waste as such is subdivided **based on its origin** into industrial and domestic<sup>7</sup>. Industrial waste is solid production waste generated as a result of chemical and thermal processing of natural materials<sup>8</sup>. Industrial waste is classified into classes I to V of hazard according to the Federal Classification Catalog of Waste, FCCW (see below).

Domestic waste is consumption waste generated by households as a result of private life<sup>9</sup>. Regarding waste from households with hazardous properties there are no specific procedures on separate collection, transportation, disposal or treatment.

Secondly, according to the article 4-1 of the Federal Law on Waste, all production and consumption waste is to be assigned to one of the following hazard classes from July 2009 on:

Class I: extremely hazardous waste (e.g. containing mercury);

Class II: highly hazardous waste (e.g. containing lead, remnants of hydraulic oil, technical devices containing halogens that have lost their consumer properties, etc.);

Class III: moderately hazardous waste (e.g. containing copper, remnants of silicon oils or diesel fuel, etc.);

Class IV: low hazard waste (e.g. containing nickel in pieces, aluminum, mixes of solid various plastics, aluminum packing contaminated with combustibles and lubricants (their content may not exceed 15% by weight), etc.)

Class V: practically safe waste (e.g. uncontaminated aluminum wire that has lost its consumer properties, food waste, etc.)

In practice, waste is attributed to one or another class based on **the Federal Classification Catalog of Waste (FCCW / FKKO)**<sup>10</sup>. FCCW is a list of waste generated in the Russian Federation, which is classified by a system of priority signs (determining origin, aggregative and physical state, hazardous properties, and scope of adverse effect on the environment)<sup>11</sup>.

The type of waste is determined by a thirteen-digit code, which describes its general classification signs.

If there is no explicit waste name in **FCCW**, the hazard class of waste is assigned based on possible adverse impact on the environment in case of either direct or indirect influence in accordance with **“the Criteria of Classes of Hazardous Waste”**.

Waste can be attributed to a certain hazard class using calculations or experimental methods. Assignment of environmental hazard class is performed by the individual entrepreneur or legal entity and certified by the territorial body of Rostekhnadzor (“2-TP Instruction”, cl.7).

In the new version of the law, which came into effect on June 30, 2009, the definition of hazardous waste was removed and the term was replaced with *class I-IV waste*.

Thirdly, Rospotrebnadzor bodies use sanitary and epidemiological classification of waste by its **toxicity**<sup>12</sup> (not including such dangerous properties as radioactivity, flammability, hygienic properties, etc.) into four hazard classes:

1 class – extremely hazardous,

2 class - highly hazardous,

3 class - moderately hazardous,

4 class - low hazardous.

Even though these classes are the same as those mentioned above, they are derived from completely different procedures of different legal requirements. The respective document (SP 2.1.7.1386-03) contains no references to the Federal Law on Waste, FCCW, and the Criteria for Classes of Hazardous Waste. The requirements of waste attribution to hazard classes

7 C.f. article 8.

8 GOST 25100-95 “Soils. Classification”.

9 GOST 30772-2001 “Resource saving. Waste treatment. Terms and definitions”.

10 adopted by the order of the Ministry of Natural Resources of Russia of 02.12.2002. N 786.

11 The Federal Classification Catalog of waste of kept as part of the state waste cadastre in accordance with the article 20 of the Federal Law on Waste.

12 Order of the Chief Sanitary Inspector of Russia of June 16, 2003, N 144, on enactment of SP 2.1.7.1386-03 “Sanitary rules of determining the hazard class if hazardous production and consumption waste”.



under this classification also apply only to legal entities and individual entrepreneurs.

There is also a separate classification of healthcare/medical waste (**waste of therapeutic institutions**), which includes materials, substances, and products that have lost all or some of their initial application properties through manipulations performed at medical institutions<sup>13</sup>.

Any healthcare waste shall be assigned to one of five hazard classes based on the degree of its epidemiologic, toxicological, and radiation hazard:

Class A. Non-hazardous waste of therapeutic institutions.

Class B. Hazardous (risky) waste of therapeutic institutions.

Class V. Extremely hazardous waste of therapeutic institutions.

Class G. Waste of therapeutic institutions that is close to radioactive waste by composition. The degree of toxicity of each kind of waste in this class is determined according to the classifier of toxic industrial waste and system instructions on determining the class of industrial waste.

Class D. Radioactive waste.

Classes in this specification are assigned by the source, i.e. the place of generation.

- Thus, certain waste types such as electronic waste, oil and lubricant waste, and mercury waste may be classified as hazardous only if they are industrial by origin. Attribution is carried out specifically for each kind of waste: based on FCCW for data supplied to Rostekhnadzor;
- based on SP 2.1.7.1386-03 to get Rospotrebnadzor approval.

## 4.2 Hazardous wastes management requirements and regulations

### 4.2.1 Responsibilities of industrial hazardous waste generator

Until recently the definition of “waste handling” included also all measures related to the waste generation. Thus the duties of waste generators and companies in charge of collection, use, deactivation, transportation, and disposal of waste were similar. From 30.06.2009, waste generation was excluded from the “waste han-

dling” term, though it has not so far resulted in any principal changes of liabilities of waste generating and other companies.

There are plenty of responsibilities related to waste minimization and management. Legal entities and individual entrepreneurs must:

- Design draft waste generation norms and disposal limits (PNOOLR) aiming at reduction of waste generation, and then submit these drafts for approval to the territorial body of Rostekhnadzor
- Implement low-waste technologies based on the latest scientific and technological achievements. (Fulfillment of this requirement is not an object of state environmental control in a real life, and there are no penalties for incompliance).
- Carry out inventories of waste and sites for its disposal; and perform a monitoring of the environment conditions at waste disposal sites. (This requirement is implemented through PNOOLR design and annual technical report on the consistency of the technical processes, raw materials used, and waste treatment, which the nature user supplies to Rostekhnadzor).
- Provide required information on waste management in a due order. Such information is provided on requests from governmental bodies (as state Russian authorities must supply information on waste management to the population in accordance with the article 5 of the Federal Law on Waste) and during the state environmental control. Major sources of information are PNOOLR and Form 2-tp “Waste”.
- Comply with accident prevention requirements related to waste management, and take urgent measures for negative impacts elimination;
- In case of occurrence or threat of accidents related to waste management, which will or may harm the environment, human health, or property of individuals or legal entities, inform federal executive bodies in charge of waste treatment, executive bodies of the Russian Federation subjects, and local self-administration bodies about this fact immediately.
- Confirm waste attribution to a certain hazard class in the order established by federal executive bodies in charge of waste treatment;

<sup>13</sup> GOST 30772-2001 Resource saving. Waste treatment. Terms and definitions.

- Make a passport for waste classes I-IV taking into account the data on composition and properties of this waste and assessment of its danger (no passport is required for class V);
- payment for waste disposal (including possible extra payment for exceeding amounts).
- Inform Rospotrebnadzor and Rostekhnadzor about the results of industrial environmental monitoring.

The enterprises must have technical and process documentation on use and deactivation of waste generated during construction, reconstruction, temporary lay-off and liquidation of buildings, structures, and other facilities.

For organizations operating in the area of management, culture and art, physical education and sports, education, insurance, and other financial and credit institutions, the list of liabilities has been reduced: they do not submit annual reports according to the 2-TP form and design the PNOOLR draft in a simplified form. From June 30, 2009, small and medium-sized enterprises are relieved from PNOOLR, and submit only notifications on collection, use, deactivation, transportation, and disposal of waste (no form has been designed yet.)

Analysis of relevant reporting forms is provided below.

#### 4.2.1.1 PNOOLR

According to the article 24 of the Federal Law on Environmental Protection, norms for production and consumption waste and limits for its disposal are established for prevention of negative effect on the environment.

“Waste generation norm” determines the allowed amount of waste of certain type produced per product unit. Norms are designed based on methodical instructions adopted by Rostekhnadzor.

“Limits” establish the maximum allowed amount of waste taking into account the waste types that may be placed using a certain method for a certain time at waste disposal sites with consideration of the environmental situation of the area.

While preparing PNOOLR, a company calculates the volume and expected amount of certain waste (classes I-IV and low hazard) which will be generated in the next 5 years. Approval of PNOOLR by the territorial

Rostekhnadzor body means that a permit is granted for waste generation in the framework of the allowed norms and limits. PNOOLR also includes a plan of operational movement of waste, information on use or/and deactivation of waste at the company; waste storage description for up to 3 years and description of the maximum waste accumulation amount; waste storage description for more than 3 years and waste burial at the company; monitoring of the condition of environment at waste disposal sites and within the area of their environmental effect; plans for activities for reducing the generation and disposal of waste, enforcement of compliance with the effective norms and regulations in the waste management area, and information on emergency measures.

Companies supply a technical report to Rostekhnadzor on the consistency of the production process, raw materials, and waste treatment (which is also a report on performance of activities and monitoring) on an annual basis.

#### 4.2.1.2 Hazardous waste passport

A passport shall be made for the class of hazard (I-IV) of waste and the class of toxicity for humans (I-IV). The order of passport issuance is set forth by the Russian Government.

A passport is a mandatory part of technical documentation for any waste at all stages of its lifecycle and is the basis for technological, economical, legal, and other decisions regarding Class I-IV waste, including possibility of transboundary movement of this waste, fees and fines for waste disposal, above-limit generation of hazardous waste, etc.<sup>14</sup>

The hazardous waste passport form shall be completed individually for each type of waste produced (Instruction on completion of hazardous waste passport forms, Order of the Ministry of Natural Resources of Russia from 02.12.2002 N 785 “On adoption of the hazardous waste passport, clause 3)). Passport must be approved by the territorial body of Rospotrebnadzor.

Passport shall be made and registered before the first lot under the passport waste are taken outside the company where it was generated. At any action on the received waste, including mixing with other materials, the consignee shall in case of transportation outside its company issue and register a new passport for this lot (or any parts of the lot).

Hazardous properties of waste shall be established in accordance with the requirements of appendix III

<sup>14</sup> GOST 30774-2001 Resource saving. Waste treatment. Waste hazard passport. Basic requirements.



to the Basel Convention on Control of Transboundary Movements of Hazardous Wastes and Their Disposal and the federal legislation. As soon as extra or new information is available, which raises the completeness and reliability of data included in a compulsory section of the passport, the passport shall be renewed and re-registered. The passport will expire one year after the registration and/or in case of any technical changes in the waste generation process.

#### 4.2.1.3 2-TP “Waste” reporting form

The 2-TP “Waste” reporting form (“Data on generation, use, deactivation, transportation, and disposal of production and consumption waste”) is a general annual report of a company as a legal entity on all the production and consumption waste (accumulated, disposed, recycled, transferred to other organizations during the reported period, etc.). It is a subject to environmental control, which is aimed at detecting violations of waste generation norms and impose relevant fees for above-limit waste disposal. The form shall be completed based on original accounting data and must represent the actual situation.

The report is drawn based on a list of wastes prepared in the framework of PNOOLR and passports of hazard class I-IV waste. The form shows a balance of waste: accumulated at the beginning of the year, received later on, used, deactivated, transferred to other organizations and for burial, etc.

#### 4.2.2 Requirements related to hazardous waste in household waste

Federal legislation does not require separate collection of hazardous waste from households. Neither are there are requirements for municipalities regarding separate hazardous waste collection from individuals.

There are no requirements for separate collection of hazardous waste from condominium associations (“partnerships of residence owners” in Russian), residence cooperatives, or managing companies, which collect money for waste disposal from inhabitants and make contracts with transport companies. The effective legislation (urban planning and environmental), on the one hand, requires all the maintenance infrastructure of an apartment building, including waste collection infrastructure, to be located on the building’s land, but on the other hand, it contains no requirements for separate collection of hazardous waste for organizations who maintain these buildings.

#### 4.2.3 Medical waste management

Medical waste management is regulated by federal legislation<sup>15</sup>, which includes FL on Sanitary-Epidemiological

Well-Being and subsequent bylaws.

At present, the Sanitary Regulations 2.1.7.728-99 “Soil, cleaning of inhabited areas, household and industrial waste. Sanitary protection of soil. Rules of collection, storage, and disposal of healthcare institution waste” (hereinafter referred to as the Rules of medical waste collection) (enacted in 1999) are in force in Russia. These regulations are effective in the part that does not contradict with the federal laws and regulations of Russia, which were adopted later. These regulations take account of the requirements of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal of 1992. These Rules are designed for all healthcare institutions, organizations that collect, store or transport medical waste, and design and operation of plants for processing and deactivation and burial grounds for solid waste.

At the premises of a healthcare institution, the system of collection, temporary storage and transportation of waste shall be organized by trained personnel, including the following elements:

- waste collection inside departments;
- transportation of waste and reloading it into larger (for several buildings) containers;
- temporary storage of waste at the premises of a healthcare institution;
- transportation of containers to the waste deactivation place.

All the medical waste is subdivided by the degree of its epidemiological, toxicological, and radiation waste into five hazard classes:

**Class A (A).** Non-hazardous waste of healthcare institutions. Non-toxic waste that has not come into contact with patients’ biological fluids, contagious patients. Food waste of all the departments of healthcare institution except infectious disease and tuberculosis units. Furniture, inventories, faulty diagnostic equipment that do not contain toxic elements. Non-infected paper, swept waste, construction garbage, etc.

**Class B (B).** Hazardous (risky) waste of healthcare institutions. Potentially infected waste. Materials and tools contaminated with excretes including blood. Excretes of patients. Autopsy waste. Organic surgery waste (organs, tissues, etc.) Any waste from infectious disease units (including food waste). Waste from

<sup>15</sup> FL on Waste, article 2, part 2.

A license is required for collection, use, deactivation, handling, and disposal of class I-IV waste.	Federal Law "On Licensing of Certain Types of Activity" (sub clause 74, clause 1, article 17)
No license is required for temporary storage of class I-IV waste and for collection, use, deactivation, handling, and disposal of class V waste	Federal Law "On Licensing of Certain Types of Activity" (sub clause 74, clause 1, article 17)
The license shall be registered at territorial authorities of Rostekhnadzor covering the location of performed activity, and these authorities shall control compliance with the respective license requirements and conditions of this activity.	Federal Law "On Licensing of Certain Types of Activity" (clause 10, article 18)
A license is required for each of the following: 1) collection, 2) use, 3) deactivation, 4) transportation, 5) disposal of class I-IV waste.	Federal Law "On Licensing of Certain Types of Activity" (part 1 article 7).
The licensed activity may be performed only by the licensed legal entity or individual entrepreneur.	
The term of the license may not be less than 5 years.	Federal Law "On Licensing of Certain Types of Activity" (article 8).
The following is classified as violations of the license requirements and conditions: <ul style="list-style-type: none"> <li>— allowing persons who have no professional qualifications proven with certificates to handle hazardous waste;</li> <li>— transportation of hazardous waste without a duly issued hazard class I – IV waste passport;</li> <li>— absence of process control over compliance with the Russian law on waste treatment if the licensee is a legal entity;</li> <li>— violation of safe waste treatment regulations if it leads to a life threat or/and conditions for a man-caused emergency situation or substantial damage to the environment.</li> </ul> In case of the abovementioned violations the license may be withdrawn.	Statute on Licensing of Collection, Use, Deactivation, Handling, and Disposal of Hazardous Waste (adopted by the Russian Government Order of 26.08.2006 N 524).
When applying for a license for hazardous waste management (classes I – IV), the applicant shall provide the following documents: <ul style="list-style-type: none"> <li>— List of classes I – IV waste, which the applicant is planning to handle;</li> <li>— Copies of certificates proving the competence of the individual entrepreneur or staff of the legal entity that will handle hazardous waste;</li> <li>— Copies of documents proving that the applicant has its own or rented premises, facilities for placement of hazardous waste, special plants for neutralization of hazardous waste, and specially equipped vehicles with special signs in accordance with the requirements;</li> <li>— Copy of the sanitary and epidemiological conclusion on compliance of the business of hazardous waste management to the sanitary regulations.</li> <li>— Copy of the positive conclusion of the state environmental review of design documentation of facilities that relate to placement and neutralization of hazardous waste with the exception of facilities that were commissioned or permission for construction of which was granted before June 15, 2009 (before the amendments to the Ordinance "On licensing..." came into force);</li> </ul>	Federal Law "On Licensing of Certain Types of Activity" (article 13)  Russian Government Order of 26.08.2006 No. 524 "On the Adoption of the Ordinance on Licensing of the Business of Collection, Use, Deactivation, Transportation, and Disposal of Hazard Class I – IV Waste" (as edited by the Russian Government Order of 15.06.2009 N 486)

microbiological laboratories working with pathogenic organisms of 3-4 groups. Biological waste of vivaria.

**Class B (C).** Extremely hazardous waste of healthcare institutions. Materials that were in contact with patients with especially dangerous infections. Waste from laboratories working with organisms of pathogenic 1-4 groups. Waste of tuberculosis and mycology hospitals. Waste from patients with anaerobic infections.

**Class Г (D).** Waste of healthcare institutions that are closer to industrial waste by composition. Expired medicines, waste from medicines and diagnostic drugs, disinfectants that may not be used, which have expired. Cytostatics and other chemicals. Mercury-containing items, devices, and equipment.

**Class Д (E).** Radioactive waste of healthcare institutions. Any kind of waste containing radioactive components.

Requirements to the conditions of collection, temporary storage, and transportation of waste are different depending on its class. It is not allowed to mix waste of various classes at any stages of their treatment. The terms and conditions of storage and transportation are regulated separately for classes (e.g. storage and transfer of A, B, and C class waste inside the health-

care institution is allowed in leak proof reusable containers only).

Class A waste may be buried at ordinary municipal solid waste landfills. B and C class waste shall be destroyed at special local neutralization plants with thermal methods or by incineration at special plants. In the absence of a neutralization plant, epidemiologically safe waste (organs, tissues, etc.) must be buried at cemeteries in special graves. Other class B waste may be taken to municipal solid waste landfills after disinfection by way of submerging into a disinfectant solution. Transportation, neutralization, and disposal of class D waste shall be in accordance with hygienic regulations made to the order of collection, transportation, neutralization, and storage of toxic industrial waste.

#### 4.2.4 Licensing, permits and certification requirements

##### 4.2.4.1 Licenses

Licenses in the waste management sector are issued by Rostekhnadzor. A summary of licensing, permits and certification requirements for entities involved in hazardous waste management presented in the table above.

A hazardous waste treatment license includes a list of waste (substances) permitted for handling with the following information on waste:

- Name of waste;
- Code of waste according to the federal classification catalogue of waste;
- Hazard class for the environment;
- Hazard class for humans;
- Types of activities performed;
- Place of business (including branches and separate subdivisions).

The license does not specify a monitoring program or other specific requirements to environmental protection.

#### 4.2.4.2 Regulations of emissions and discharges from toxic waste processing plants and landfills

Regulation of emissions (of gases into the atmosphere) and discharges (of pollutants into water bodies) for landfills is performed in the same way as for other enterprises, i.e. through calculation of permissible emissions (PE) and discharges (PD) basing on approved methods. For emissions, the basic criterion is that the maximum permissible concentration (MPC) of any pollutant shall not be exceeded on the border of sanitary protection zone (SPZ). The border of SPZ is established in two or three stages:

- on the bases of fixed distances established in SanPiN “Sanitary Protected Zones...”<sup>16</sup> for classes of sanitary hazard of enterprises (1000, 500, 300 meters or less);
- on the bases of calculations performed according to the OND-86 method<sup>17</sup>, usually by means of certified programs;
- on the bases of direct measurements (established SPZ).

Thus, an enterprise first declares a certain amount of emissions depending on the production capacity, technologies applied, etc., after which the SPZ size is calculated based on the height and location of pipes, typical atmospheric conditions, wind rose, background pollution of the atmosphere, and other factors. The SPZ size is set according to greatest impact. After that, PE for every substance is set for this enterprise based on the abovementioned criterion, which is not exceeding 1 MPC on the border of SPZ.

For discharges, a similar criterion is not exceeding MPC in the control cross section. The control cross section is set on the level of the nearest water intake or a place important for fishery, and if there are none of such, at a distance of 1 km from the discharge source.

In the Russian legislation the emission limit values of flue gases of waste incineration facilities are defined based on maximum permissible concentration of pollutants in ambient air at the boundary of sanitary protection zone of the enterprise. Thus, there are no direct limit values of harmful substances in flue gases common for all waste incineration facilities like in the EU Directives and HELCOM recommendation 16/8 “Restriction of Emissions into the Atmosphere and Discharges into Water at Incineration of Domestic Waste.” In Russia the emission limit values are common for all facilities, including waste incineration plants.

The applicable legislation contains no direct prohibition to place industrial enterprises or their parts in SPA (except pharmaceutical or food factories). For “clusters” of factories, it is recommended to establish a common SPA. After launching the facility, the actual concentrations are to be measured to demonstrate that they do not exceed the limits.

One factor complicating the SPA calculation is limited data on background concentration of pollutants. The only official source of such data is Roshydromet<sup>18</sup>, which has quite a limited network of stations and a small list of substances detected.

#### 4.2.5 Storage requirements

Federal Law on Waste (article 1) sets up several definitions of waste storage process according to its purposes:

“Waste storage” – waste storage in waste disposal facilities for further burial, deactivation, or use.

“Waste accumulation” - temporary storage of waste in areas (on sites) equipped in accordance with the environmental protection legislation and legislation on sanitary-epidemiological well-being of the population, for further use, disposal, or handling. Before 2009, this

<sup>16</sup> Order of the Chief Sanitary Inspector of Russia from 25.09.2007 N 74 “On Enactment of the New Edition of Sanitary and Epidemiological Rules and Norms, SanPiN 2.2.1/2.1.1.1200-03 “Sanitary Protection Zones and Sanitary Classification of Enterprises, Structures, and Other Facilities.”

<sup>17</sup> OND-86 Method for calculation of concentrations of harmful substances discharged by enterprises in the atmospheric air (Order of USSR Goskomgidromet of 04.08.1986 N 192).

<sup>18</sup> Roshydromet = Federal Service for Hydrometeorology and Environmental Monitoring.

term was used only in the legislation on sanitary-epidemiological well-being of the population.

“Waste disposal” – final storage and burial of waste.

“Burial of waste” – isolation of non-reusable waste in special storage facilities for prevention of harmful substances penetrating the environment.

Additionally, SanPiN “Requirements to disposal...” specifies the following storage types:

- temporary storage at production facilities at open sites or special rooms (workshops, warehouses, open areas, tanks, etc.)
- temporary storage at production facilities of basic and supplementary (subsidiary) waste disposal plants (in barns, storage facilities, collector bunks) and intermediary (receipt) points of collection and accumulation including terminal, railway marshaling yards, river and sea ports;
- storage outside production facilities – at improved landfills for industrial waste, sludge storage facilities, refuse heaps, ash dumps, and specially equipped facilities for their processing and burial;
- storage on site for sludge dewatering from water treatment plants.

Requirements to organization of storage, disposal and accumulation of hazardous waste are given in SanPiN “Requirements to disposal...” including general requirements to site, premises, packing, and accumulation limits.

Responsibility for safe storage and use of hazardous waste lies on the director of the company where the hazardous waste is located.

#### 4.2.6 Transportation requirements

##### General

According to Federal Law on Waste (article 16), the following is required for hazardous waste transportation:

- Carrier must have a copy of the waste passport of hazard class I-IV;
- Vehicles must be specially equipped and have special signs;
- Safety requirements to vehicle transportation of hazardous waste must be fulfilled;

- There must be a contract for hazardous waste transaction stating the amount of transported hazardous waste and the purpose and destination of its transportation;
- The company must bear a license for hazardous waste transportation.

The order of transportation of hazardous waste on vehicle, requirements to handling operations, packing and parking of hazardous waste, and requirements to environmental and fire safety measures shall be determined by state standards, rules and norms designed and adopted by federal executive authorities. However, at present there are only two documents:

- SanPiN 2.1.7-95. Order of storage, transaction, burial, and disposal of (toxic) industrial waste.
- SanPiN “Requirements to Disposal.”

which contain no specific provisions<sup>19</sup>, and one specialized regulation that covers collection, transaction and burial of asbestos-containing waste<sup>20</sup>.

Russia has joined ADR (Russian Government Order of 03.02.1994 N 76 “On Russia’s joining the European agreement on international transportation of hazardous cargoes”). By implementation of ADR, the Rules of Hazardous Cargo Transportation by Car were adopted (order of the Ministry of Transport of Russia of August 9, 1995, N 73), which apply to waste transportation. However, the Rules contain their own classification of hazardous cargoes by nature and degree of hazard (9 classes), where “hazardous waste” or “waste” are not mentioned. An appendix to the Rules sets forth a list of hazardous cargoes allowed for transportation by car, which contains certain types of waste, no more than 10 entries. The list mainly contains chemicals.

The Rules set forth the order of transportation of any hazardous cargoes by car by any common use roads and are compulsory for all organizations and individual entrepreneurs. Licensing of hazardous cargo transportation is performed in accordance with the applicable legislation of the Russian Federation on licensing. Special permits are required for international trans-

<sup>19</sup> All cars must have special equipment. Each series of cars shall be certified. Design and operation conditions of special vehicles must leave no chance for accidents, loss, and environment pollution on the way and at transshipment of waste from one vehicle to another. All the handling and transaction operations at the main and supplementary processes must be mechanical and hermetical when possible.

<sup>20</sup> MU 2.1.7.1185-03 Collection, transportation, and burial of asbestos-containing waste (Order of the Chief Sanitary Inspector of Russia of 23.01.2003).



portation and transportation of “especially hazardous cargoes.” There are special requirements to routes of transportation, organization of the system for informing about the danger including documentation and signs on vehicles, control of package integrity at acceptance of cargoes, organization of handling, vehicle traffic, cleaning and repair of package, and liquidation of consequences of accidents and emergencies.

At transportation of hazardous cargoes, the driver may not divert from the established route and parking lots that have been approved by the State Car Inspectorate (GAI) of the Ministry of Interior of Russia (MVD) or exceed the allowed maximum driving speed.

Transportation of various classes of hazardous cargoes on one vehicle (in one container) is only allowed within the allowed compatibility rules. Hazardous cargoes are allowed to be transported in packing conforming to GOST 26319-84<sup>21</sup> and requirements of the Rules. The gross weight of each item and capacity of immediate packing may not exceed the maximum weight and capacity set forth in the regulatory documents for hazardous cargoes. Packing of hazardous cargoes must correspond to the regulations for certain types of packing and requirements of GOST 26319-84 and ensure safety of the cargoes at handling, transportation, and storage.

At transportation of “especially hazardous cargoes” by car, the consignor (consignee) must receive a transportation permit from authorities of the interior at its location. To obtain a permit for transportation of “especially hazardous cargoes,” the applicant shall file an application to the authorities of the interior at the place where the cargo will be accepted stating the name of the hazardous cargo, amount of items and substances, transportation route, persons in charge of transportation or/and persons guarding the cargo on the way.

The route approved by GAI of the Ministry of Interior shall be valid for a period stated in the permit of up to 6 months from the approval date. The order of guarding the cargoes and the convoy is regulated too, in particular, by forces of GAI.

“Especially hazardous cargoes” are not allowed to park nearby settlements. Parking is allowed only in specially designated lots located at least 200 meters away from residential buildings and places with large numbers of people.

International transportation of hazardous cargoes including export, import, and transit through the Russian Federation shall be carried out in compliance with norms and regulations set forth by international conventions and intergovernmental agreements, to which the Russian Federation is a party. At interna-

tional transportation of hazardous cargoes, the Rules recommend following the requirements of the Basel Convention.

### Implementation of the Basel Convention

The Basel Convention on the Control over Transboundary Movements of Hazardous Waste and their Disposal **was ratified by the Federal Law of 25.11.1994 N 49-FZ.**

The following regulations were adopted for implementation of the Convention:

Russian Government Order of 17.07.2003 N 442 “On transboundary movement of waste” **setting the rules of transboundary movement of waste.**

The Rules set forth the order of import of hazardous and other waste into Russia, export of waste, and transit. The Rules contain terms from the Federal Law “On waste...” and the Basel Convention.

To get a permit for each transboundary movement of waste, the applicant shall submit the following documents to the Ministry of Natural Resources and Ecology of Russia (its territorial authority):

- an application stating the name of waste according to the federal classification catalogue of waste, its amount, code of the Commodity Nomenclature of Foreign Economic Activity of the Russian Federation (TNVED), and a list of involved companies participating in the transboundary movement of waste;
- copies of constituent documents and the certificate of state registration of the applicants and a copy of the registration of the applicant with a tax authority;
- a notice of transboundary movement of waste (3 original copies);
- document about waste transportation;
- copies of the license for collection, use, deactivation, transportation, and disposal of hazardous waste and of the hazardous waste passport;
- copies of the transportation contract and the contract between the exporter and the person in

<sup>21</sup> GOST 19433-88 Hazardous cargoes. Classification and marking (Order of the USSR Gosstandart of 19.08.1988 N 2957).

Category	Description of non-recyclable industrial waste by type of pollutant that they contain	Recommended storage or deactivation method <sup>22</sup>
1	Practically inert	Use for construction of landfill or storage with municipal solid waste
2	Biologically oxidizable and easily degradable organic matter	Storage or processing <sup>23</sup> with municipal solid waste
3	Low toxic, slightly soluble in water including interaction with organic acids	Storage with municipal solid waste
4	Oily, non-regenerable according to the effective instructions	Incineration <sup>24</sup>
5	Toxic with low air pollution (MAC exceeded 2-3 times)	Storage on a special landfill for industrial waste
6	Toxic	Combined or individual deactivation at special structures

<sup>22</sup> Toxic industrial waste deactivation is performed at special utilities – toxic industrial waste burial grounds.

<sup>23</sup> There are no special deactivation rules.

<sup>24</sup> MSW incineration at landfills is not allowed, and measures must be taken for prevention of MSW ignition (Sanitary rules of 30.05.2001 N 2.1.7.1038-01).

charge of disposal of the waste stipulating environmentally safe usage of this waste;

- a permit of a competent authority allowed by the Basel Convention in the country where the waste shall be imported if it is removed (taken by transit) outside (through) the Russian Federation;
- a copy of a document certifying that the applicant has made guarantees in accordance with the clause 11 of the article 6 of the Basel convention;
- a document confirming payment of the state fee.

For providing incorrect data the applicant is held accountable in accordance with the legislation of the Russian Federation.

Permits for transboundary movement of waste are issued by Rostekhnadzor. The administrative regulations of performance of this function were adopted by the Order of the Ministry of Natural Resources and Ecology of Russia dated 31.10.2008.

Waste transportation through Russia is carried out in accordance with requirements set forth by the legislation of the Russian Federation (see section 4.2.5).

#### 4.2.7 Requirements for landfills / destruction facilities

Several laws govern placement and construction of waste disposal facilities, including waste burial. Waste

disposal facilities may be established by the virtue of permits issued by federal executive bodies in charge of waste management (Federal Law on Waste, article 12). Waste disposal facilities shall be located in special purpose zones (clause 13 of the article 35 of GrK RF).

Since 2009, project documentation on facilities aimed at disposal and deactivation of waste (hazard class I-V) is a subject to state environmental review (Sub clause 74 of the article 11 of Federal Law on Environmental Review).

From January 2010 waste disposal facilities shall be included in a state register. State register of waste disposal facilities shall be kept in the order set forth by the federal executive body authorized by the Russian Government. No regulations on that have been issued so far, but it is expected that using non-registered facilities for waste disposal will become illegal.

Special requirements to construction of waste management facilities are determined by Gosstroy Ord SNiP 2.01.28-85. "Deactivation and burial ground for toxic industrial waste. General provisions on design." (1985). This SNiP contains:

- Requirements on accepting waste of various hazard classes to the burial ground;
- Requirements on disposal, planning and building solutions for the deactivation plant, burial sites, supplementary area, evaporation ponds etc.;
- Requirements on waste deactivation including incineration (quite detailed for various waste types);
- Requirements on making facilities/ponds for burial of waste with various properties, requirements on burial in containers and bunkers;
- Recommendations for mechanical operations, arrangement of a sanitary protected area.
- Appendices with a list of waste groups and processing methods (recommended) and designs of impervious layers.

Additional, but less detailed requirements to waste disposal sites are set in SanPiN 2.1.7.1322-03 "Requirements to Disposal". SanPiN allows storage of hazard class III-IV waste together with domestic waste (MSW) in amounts of up to 30% of the MSW mass, provided that certain environmental safety requirements are fulfilled (to be determined using chemical tests).

Appendices contain the lists of waste types which can



Violation	Subjects	Punishment	Law that imposes liability
Non-compliance with environmental and sanitary-epidemiological requirements in treatment of production and consumption waste or other hazardous substances	Legal entities, officials, individual entrepreneurs, and individuals	Administrative fine or administrative suspension of operation up to 90 days	article 8.2 of the Code of Administrative Offenses of the Russian Federation (KoAP RF)
Destruction of the fertile soil layer or spoilage of soil, caused by violating the rules on handling and processing of waste and substances that may cause harm to human health and the environment	Legal entities, officials, individual entrepreneurs, and individuals	Administrative fine or administrative suspension of operation up to 90 days	clause 2 article 8.6 of KoAP RF
Pollution of water bodies with waste and hazardous substances	Legal entities, officials, and individuals	Administrative fine	clause 5, article 8.13 of KoAP RF
Violating the rules of waste and other items burial in domestic sea water, territorial sea, on the continental shelf or/and in an exclusive economic area	Officials	Administrative fine, ship confiscation	article 8.19 of KoAP RF
Pollution of forests with wastewater, chemical, radioactive, and other harmful substances and production and consumption waste	Legal entities, officials, individual entrepreneurs, and individuals	Administrative fine or administrative suspension of operation up to 90 days	clause 2, article 8.31 of KoAP RF
Failure to pay on time for negative impact on the environment	Legal entities, officials	Administrative fine	Article 8.41 of KoAP RF
Violating the rules of environmentally hazardous substances and waste treatment	Person responsible for compliance with the rules of HW treatment	Fine or imprisonment for a certain term	article 247 of the Russian Criminal Code
Destruction or damage of forests or plants that are not classified as forests caused by pollution with harmful substances, waste, discharge or refuse	Any person aged 16 or more	Fine or imprisonment for a certain term	part 2, article 261 of the Russian Criminal Code
Hiding, purposeful distortion, delayed supply of complete and true information on the environmental and natural resources conditions, pollution sources, or other harmful impact on the environment by persons who are obliged to provide such information. (failure to report)	Officials, legal entities	Administrative fine	Article 8.5 of KoAP RF
Violation of environmental protection rules at design, location, commissioning, and operation of industrial, agricultural, scientific, and other objects by persons in charge of compliance with these rules if it caused significant change of the radioactive background, damage to human health, mass death of animals or other serious consequences (industrial accidents)	Officials	Fine, corrective work, compulsory work, deprivation of right to take certain positions on engage in certain activities for up to three years or without	Article 246 of UK RF

be disposed of together with domestic waste. They also contain lists of solid waste, sludges, and toxic industrial waste, which may not be disposed of at MSW landfills.

There are also special requirements on collecting/receiving slightly toxic industrial waste to municipal landfills (improved MSW dumps) dating back to 1977, which contain a set of contradictory recommendations.

It is worth mentioning that waste coming to landfills is a subject to dosimeter control only; there is no laboratory toxic waste presence control.

#### 4.2.8 Hazardous waste management enforcement and control

The Federal Law on Waste specifies three forms of control in this area: state, public and internal control of the company. State environmental control is performed by Rosprirodnadzor. The statute on public control is not detailed and this provision is not applied in practice because there is no relevant federal legislation.

The following elements are specified as subject to

environmental control:

- compliance with norm<sup>25</sup>, state standards and other regulations in environmental protection, operation of treatment facilities and other deactivation plants, control means, and implementation of plans and measures for environmental protection;
- compliance with environmental requirements, norms, and rules concerning placement, operation, and decommissioning of facilities;
- compliance with requirements that are stated in the conclusion of the state environmental review for the facility.
- During checks, state inspectors may:
  - demand and issue prescriptions to individuals and legal entities on correction of violations of environmental legislation to be found;

<sup>25</sup> PNOOLR

- bring persons who have allowed violations of the environment protection law to administrative responsibility.

Failure to provide safe waste management may entail restriction or even prohibition of individual entrepreneurs or legal entities operations (clause 4 of the article 14 FL on Waste).

#### 4.2.8.1 Relevant authorities and their mandates

The enforcement authorities and their responsibilities including the legislation of their mandate is based on are presented in the table below.

#### 4.2.8.2 Federal and regional sharing of control and enforcement responsibilities

Subjects to the Federal executive bodies (state control, bringing violators to administrative responsibility) have been specified in a separate order<sup>26</sup>. In relation to all other entities, government control is performed by the regional authorities (subjects of the Russian Federation).

The list of entities subject to Federal control includes, i.e. enterprises that are part of the federal electric power and other (national) infrastructure, nuclear industry, security and defense, production of poisons and drugs, shelf projects, projects (enterprises) affecting the World Heritage Objects and those with transboundary effects, as well as especially dangerous technical installations. In addition the list contains objects which are subject to Federal control in accordance with the forest, waster, and land laws or subsurface law.

### 4.3 Waste minimization

There is a well developed legal base for resource saving and waste minimization measures and regulations. Economic incentives are included as follows:

- reducing the fee for waste disposal if the company implements waste-reducing technologies;

- accelerated depreciation of capital assets in relation to waste treatment.

However, this provision has not been considered very effective in practice or it is not economically attractive enough as the payments for waste disposal itself are low.

### 4.4 State statistical reporting on wastes

For federal state statistical monitoring, form N 2-TP (Waste) is used. This form is supplied yearly to the territorial body of Rostekhnadzor, which later on forwards it to federal Rostekhnadzor (headquarter) and then to Rosstat (Russian Statistical Service).

All types of waste handled by an individual entrepreneur or legal entity are the subject to accounting/reporting.

<sup>26</sup> "On the list of objects subject to state environmental control" (Russian Government order from 31.03.2009 N 285).

Authority	Mandate	Statutory Act
Rosprirodnadzor	Supervision of compliance with the Russian legislation in the area of environmental protection including atmospheric air protection and waste management	Russian Government Order from July 30, 2004, N 400
Rostekhnadzor	Adopts waste generation guidelines and waste disposal limits; Keeps the state cadastre of waste and state records in the area of waste management and is in charge of hazardous waste passports; May enforce regulations within the established competency	Russian Government Order from July 30, 2004, N 401
Rospotrebnadzor	State sanitary-epidemiological supervision of compliance with the sanitary legislation; May enforce regulations within the established competency	Russian Government Order from June 30, 2004, No. 322

## 5 HAZARDOUS WASTE LEGISLATION AT OBLAST AND MUNICIPAL LEVEL

### 5.1 Relationship between Federal, Oblast, and municipal level legislation/regulations

However, in St Petersburg and in Moscow the powers of the municipalities in waste management rest with the regional governments. In St Petersburg the Housing Committee is responsible for municipal solid waste management and the Committee on Natural Resources and Environmental Protection is responsible for industrial waste management.

### 5.2 Regulations and requirements prepared at Oblast and municipal level

St Petersburg, Leningrad oblast, and Kaliningrad oblast authorities have adopted various regulations and non-regulatory acts in the areas of environment protection and management of waste between 2001 and 2009. Regional laws determine subdivision of powers between regional parliaments and regional governments. The law of Kaliningrad oblast provides opportunities for regional catalogue of waste. Due to restriction of powers, imposed by article 5 of FL on environment, regional legislation can provide more detailed instructions to waste management only. For instance, the Kaliningrad Oblast "On Production and Consumption Waste" (of 02.11.2007 №177), sets requirements for waste generation, collection, storage, transportation, handling and deactivation of waste. The document determines the order of management with biological waste, medical waste, construction and demolition waste, without specifying hazardous waste separately.

<b>Federal government authorities</b>	Set standards, rules, and requirements of safe waste treatment	FL on Environment Protection (article 5); "On the List of Facilities subject to Federal State Environmental Control." Russian Government Order of 29.10.2002 N 777.
<b>Regional authorities</b>	Pass laws and bylaws according to federal laws	FL on waste (article 6)
<b>Municipal authorities</b>	No powers in legal control of hazardous waste treatment	

In St Petersburg the City Administration has adopted a "Concept of Waste Management in St Petersburg for 2006-2014"<sup>27</sup>. The Concept deals with issues of municipal (domestic) solid waste management only, and does not consider industrial waste management. According to this Concept a number of measures were to be developed in the 8 years in question:

- Modernization of current waste treatment plants (WTPs);
- Construction of two new WTPs;
- Reconstruction of two big landfills;
- Developing the system for calculation of waste amount;
- Purchasing of new containers for separate collection of wastes;

<sup>27</sup> Order of the St Petersburg Government 02.08.2005 N 1151.

Powers of Russian governmental authorities in the hazardous waste management area	Powers of oblast/regional authorities in the hazardous waste management area	Powers of Russian local self-administration authorities in the hazardous waste management area
Setting the order of hazardous waste management. (FL on Environment Protection, art.5).	Adoption of laws and other regulations on oblast level in accordance with the Russian law, control over their implementation (FL on Environment Protection, article 6).	
Licensing of collection, use, deactivation, transportation, and disposal of hazardous waste, organization of state registration and reporting in waste treatment; providing information to public on waste management; state waste cadastre maintenance; provision of economical, social, and legal conditions for a complete use of waste and reduction of its generation (FL on Waste, article 5, FL on licensing, article 17).	Design and implementation of regional programs in waste management, participation in design and implementation of federal programs in environmental protection.	Municipal districts: <b>organization</b> of disposal and processing of household and industrial waste.
Control of conditions and methods of collection, use, deactivation, transportation, and disposal of production and consumption waste (FL on Environment Protection, clause 1 of the article 51).	Implementation of state control over waste management at business and other entities, except business and other entities that are subject to federal state environmental control.	City districts: <b>organization</b> of collection, deactivation, transportation, and disposal of household and industrial waste (FL on Environment Protection, article 7, FL on Waste, article 8).
	Participation in organization of supply of information on waste management to the population (FL on Waste, article 6).	No mandate in the area of hazardous waste management.

- Purchasing new equipment for waste-sorting plants.

All mentioned activities are financed by the City Government whereas the body responsible for their implementation is a Communal Committee of the City Government.

On August 25, 2009, the Government of St Petersburg created a new department to assume the responsibilities for the management of both industrial and domestic waste. This step will be helpful for introducing separate collection of potentially hazardous waste from households and its appropriate treatment.

A number of measures have been developed for waste management/treatment in Leningrad region (as well as the Rules of Keeping and Maintaining the Sanitary Condition of Areas in Urban and Rural areas). Since legal landfills in Leningrad region are unevenly located and transportation costs are very high in some cases, a special attention has been paid to developing the net of legal landfills in the region. Such strategy allows reduction of the level of environmental pollution, including the damage from illegal dumps/landfills. Construction of such landfills is financed by the Government of Leningrad region.

Target Program of the Kaliningrad Oblast entitled “Environmental improvement of the Kaliningrad Oblast area in 2008 - 2012<sup>28</sup>” stipulates control of environmental protection in management of production and consumption waste. It includes the following measures:

- Organizing an enterprise that will coordinate all activities in waste management sphere in the region;
- Rehabilitation of some current waste dumps;
- Developing the landfill network in the region;
- Improving the system of waste management in the region;
- Stimulating the recycling of wastes;
- Improving the system of rates for gathering, recycling, and transportation of wastes;
- Informational and educational measures.

Other regional legislation in Kaliningrad oblast includes the following:

- The Kaliningrad Region Code of Administrative Offense. Adopted by the Kaliningrad Regional

Duma on April 24, 2008 (with amendments by the Kaliningrad Region Law of 30.06.2008 No.264);

- Resolution of the District Council of Deputies of Kaliningrad City of December 24, 2008, No. 346, entitled “On the Adoption of the Rules of Sanitary Maintenance and Area Landscaping of the Kaliningrad City Urban District (amended by the following documents, namely, Resolution of the District Council of Deputies of Kaliningrad City of June 29, 2009, No. 154, Resolution of the District Council of Deputies of Kaliningrad City of June 5, 2009, No. 120, Resolution of the District Council of Deputies of Kaliningrad City of January 28, 2009, No. 5);
- Order of the Head of Administration of the Kaliningrad City urban district No. 1908 of 24.11.2008, entitled “On the Implementation of a Waste Management Information System in the Kaliningrad City Urban District”;
- Resolution of the District Council of Deputies of Kaliningrad City of October 1, No. 236, entitled “On the adoption of a Statute entitled “On the Waste Management Information System in the Kaliningrad City Urban District”;
- Order of the Chief State Sanitary Inspector in the Kaliningrad Region of February 22, 2008, No. 4, entitled “On the Adoption of a Schedule of Implementation of the Prescriptions for MSW Landfill Maintenance”.

<sup>28</sup> Appendix to Order of the Kaliningrad Oblast Government 07.12.2001 No.866 (edited on 10.12.2008).

## 6 ENVIRONMENTAL FEES FOR WASTE DISPOSAL

According to the **Federal Law on Environment Protection**, payment shall be charged for negative impact on the environment (article 16). Disposal of waste is considered such negative impact for which a payment needs to be made.

Forms of payment, calculation, and charging of the fee for negative impact on the environment are set forth by the legislation of the Russian Federation. Legal regulation of the charging of the fee is performed by the Ministry of Natural Resources and Ecology of Russia.

The fee for negative impact on the environment is not considered a tax. Paying the fee for negative impact does not relieve users of natural resources from taking measures for protection of the environment and compensating the damage for the environment.

The Russian Government Order “**On Adoption of the Order of Charging the Fee and its Maximum Sizes for Pollution of the Natural Environment, Disposal of Waste, and Other Harmful Impact**” (of 28.08.1992 N 632) sets two categories of basic payment rates:

- for waste disposal within the permitted *allowances*;
- for waste disposal within the established *limits* (temporarily agreed allowances).

Basic rates of the fee are set for each ingredient of the pollutant (waste) considering the degree of its hazard for environment and human health.

Differentiated fee rates are calculated by multiplying the basic rates by various inflation and reduction factors taking consideration of the economic and environmental aspects. When waste is disposed at specialized landfills and industrial sites located within the industrial zone of the waste generator (i.e. when there is no transportation), a 0.3 factor is applied. If waste is used (reclaimed) at the company within three years after its generation, a 0 factor is applied (no fee is charged).

For certain regions and river basins, factors are established to multiply by basic fee rates with consideration taken of the environmental factors such as nature and climate features and value of natural and social-cultural objects. E.g., the environmental factor for the Northwest Economic region is 1.3.

If the user of natural resources has no duly issued

waste disposal permit, the entire mass of pollutants is registered as exceeding the limit. A factor of 5 is applied for calculation of the fee.

Payments for maximum allowed disposal of waste are made at the expense of self-cost of products (jobs, services), and payments for disposal of above-allowance waste, at the expense of profit of the enterprise. The maximum sizes of the fee for pollution of the environment above the maximum permitted allowances are set in percentage of the profit remaining at the disposal of the user of natural resources, differently for certain sectors of the economy considering their economic features.

If the fees calculated for the economic entity for above-allowance pollution are equal to or greater than the profit, the environmental control authorities, the sanitary-epidemiologic authorities, and the relevant executive authorities shall consider suspension or termination of operation of the respective company, entity, or organization.

The effective rates of the waste disposal fee are as follows<sup>29</sup>:

Types of waste (by classes of hazard for the environment)	Basic rate per disposal of 1 ton	
	Rubles	Euro
Hazard class I waste (extremely hazardous)	1739.2	40.12
Hazard class II waste (highly hazardous)	745.4	17.19
Hazard class III waste (moderately hazardous)	497	11.46
Hazard class IV waste (low hazardous)	248.4	5.73
Hazard class V waste (practically non-hazardous)		
Raw materials sector	0.4	0.01
Processing sector	15	0.35
Other	8	0.18

Payments for disposal of waste are classified as non-tax income of the budget and credited to the budgets of the Russian Federation (20%), oblasts (40%), and municipal rural or urban districts (40%) (Article 57 of the Russian Budget Code). 80% of each payment is credited to the budget of St Petersburg.

In the expenditure part of the budgets, there is a special budget classification line entitled “**collection and removal of waste** and wastewater cleaning.” However, the principle of common coverage of budget expenditure (article 35 of the Budget Code) prohibits linking budget income to certain expenditures. Therefore, income from payments for negative impact on the

<sup>29</sup> Russian Government Order “On allowances of fee for emissions of pollutants into the atmospheric air by stationary and mobile sources, discharges of pollutants into surface and ground water, disposal of production and consumption waste” (dated 12.06.2003 N 344).



environment and waste disposal are spent by regions and municipalities as they like. The Environmental Fund of Russia and regional environmental funds, which had made it possible to accumulate payments for funding special programs, were shut down in 2001.

## **7 ENVIRONMENTAL MONITORING OF LANDFILLS**

Legal definitions of the main terms on monitoring are given in the “Law on Environmental Protection”:

- environmental monitoring – complex system of observations of the state of environment, its assessment and prognosis of changes of the SOE caused by natural and anthropogenic factors;
- state environmental monitoring – environmental monitoring performed by state authorities of the Russian Federation and subjects of the Russian Federation.

Local environmental monitoring is carried out by the enterprise (e.g. a landfill) and it comprises of monitoring of emissions and discharges etc.

State environmental monitoring is carried out by federal and regional authorities and it comprises of monitoring of general state of the environment, e.g. air quality, water quality of rivers etc.

The Russian law does not contain special requirements on monitoring the wastewater of toxic waste landfills with the exception of recommendations on location of observation points. The recommendations on observation points are specified in SNiP 2.01.28-85. It stipulates that in order to provide control over the ground water level and its physical, chemical, and bacteriological composition, there must be monitoring wells both on the landfill and in its sanitary protection zone. The SNiP includes requirements for the number and locations of the monitoring wells for different cases. The wells shall extend at least 5 m below the ground water level.

There must be similar control over drainage water placed outside the toxic industrial landfill. Sampling places shall also be located at the water discharge from the ring canal.

Local environmental monitoring is carried out by a landfill owner or by a certified external company. Each landfill must have a monitoring programme of its own. The landfill must provide a monitoring programme to Rostekhnadzor when applying the permit for discharges and emissions (not the license for waste management). The procedure is described in section 4.2.4.2 of this report. The substances to be monitored are listed in the permit, i.e. they are tailored for each landfill. There are no special requirements on how to organize environmental monitoring on landfills, thus such programs are tailored for each landfill and then are approved by Rostekhnadzor in the permitting pro-



cess. After approval the program and its implementation becomes a subject of state environmental control; results should be provided to Rostekhnadzor annually. Sampling may be carried out by the landfill owner or by an external contractor with a licensed analytical laboratory.

The legislation might be further developed as the state registry of waste disposal sites will be created in 2010. The state registry is intended to collect information (in particular) on the discharge and emission monitoring of landfills.

## 8 GAPS IN LEGISLATION

### 8.1 Introduction

The identified gaps in the hazardous waste management (HWM) regulation can be divided into several categories:

- legal gaps (e.g. inaccurate wordings, absence of legal acts stipulated by applicable law, etc.);
- organizational-legal gaps (e.g. absence of authority and duties/responsibilities);
- difficulties in law enforcement practices, caused by legal gaps, economic reasons etc.

### 8.2 Definitions and general concept

The term “hazardous waste” was removed from the Federal Law On waste in the version which came into effect on June 30, 2009. Still, this term is used the article 5 of the Federal Law On Environmental Protection which defines exclusive authorities of Russian Federation in regulation of hazardous waste management.

The legislation does not provide with a clear federal policy on measures for separate hazardous waste management. The separate waste classification systems add to the confusion.

### 8.3 Gaps in legislation concerning “domestic” waste<sup>30</sup>

The Federal legislation does not require separate collection of hazardous waste<sup>31</sup> from households. There are no regulations for individuals for managing certain types of “special waste” (such as used oils, batteries, fluorescent lamps, mercury thermometers, etc.) for treatment. In addition the legislation does not make regional or municipal authorities responsible for the establishment or operation of a system of treatment or disposal of hazardous waste.

There are no penalties, e.g. fines, for disposing of these types of hazardous waste into waste container for domestic waste. The legislation does not specify any responsibility of control over the contamination of domestic waste. Therefore, “municipal solid waste” may contain hazardous waste.

<sup>30</sup> analogue to EU MSW definition.

<sup>31</sup> In this context the term “hazardous waste” is used as it is defined in EU. In Russia these wastes are often in classes I and II and sometimes in class III.

#### 8.4 Gaps in regulations concerning industrial waste generator obligations

In general hazardous waste management of industrial facilities can be considered well-regulated. Problems described in the following arise from difficulties in enforcement and economic reasons.

Preparation of necessary documents for companies on HWM is expensive and lengthy process. The rates of the waste disposal fee for hazardous waste classes I-II are quite high. This is why some enterprises may use illegal options as it can be economically attractive, which is a challenge to the enforcing authorities.

Referring to the legal regulations, a company must design a PNOOLR (draft of standards for waste generation and disposal limits) for all wastes generated by the company and a passport for each type of waste classified as I-IV danger classes (according to the Russian official waste classification). The average cost of designing PNOOLR and a passport is app. 500,000 rubles (12,000 euro). This passport and PNOOLR should be approved by Rostekhnadzor (Federal Service of Environmental, Technological and Nuclear Supervision). In addition, it also needs to be approved by Rospotrebnadzor (Federal Supervisory Service in the Field of Consumers' Rights Protection and Human Well-being). An approval from Rospotrebnadzor is not required by the Federal Law on Wastes, but if the company does not have it, Rospotrebnadzor inspectors will require it to be obtained in accordance with the Federal Law "On Sanitary and Hygienic Wellbeing." This procedure adds to the time for getting permits (mentioned above), which are mandatory for the company operations and functioning.

If an enterprise operates without a valid permit for waste disposal, there may be a penalty for "waste disposal in the amounts more than allowed in Permit" (literal translation from the Russian legal wording). However, for some small companies the current penalties are still smaller than the official way/permitting fees, i.e. designing the PNOOLR and having it approved. Therefore, if amounts of waste are rather small, some of these companies may prefer not to pay for the new PNOOLR, but to rather pay penalties for exceeding waste generation limits (the regular payment multiplied by 5) and an administrative fine according to the article 8.2 of KoAP RF (Code of Administrative Violations of the Russian Federation). Therefore, the waste management system aimed at separate calculation/registration and treatment of waste is not fully functioning.

Although fines are quite high (30,000 – 50,000 rubles for individual entrepreneurs and 100,000 – 250,000 rubles for legal entities) and there is a threat of administrative suspension of operation for up to 90 days – in case of threat to environmental safety, this option

might still be economically attractive in some cases.

A company can also avoid paying for above-limit disposal by unauthorized disposal of undeclared waste. This might have some benefits because:

- 1) violations are not always detected or detected too late (then it is sometimes not possible to track the source of illegal waste);
- 2) if authorities detect such violations, relevant legal provisions for compensation of environmental damage are not always applied as it may be difficult to prove the extent of damage and financial compensations in a court.

To avoid paying for PNOOLR and passport design for a new type of waste and to reduce the fees for waste disposal, some companies might underestimate the hazard class.

#### 8.5 Gaps in transportation and waste disposal regulations

Some transport companies, licensed for municipal solid waste (MSW) handling, may take toxic waste from other entities "on the way", although it is not allowed in the legislation. Motivation of MSW landfills to impose strict control measures on the "waste suppliers", i.e. transport companies may be questioned as each accepted/registered truck full of waste brings in money to the waste company. Absence of a proper control system enables the receiving companies/landfills to accept trucks without appropriate documents and get paid in cash. A truck without official documents is easy to detect, but it means only administrative law violations.

In Russia it is allowed to dispose liquid waste on landfills, which is prohibited in the EU.

MSW landfills are not allowed to accept products that can be recycled. Sometimes it is difficult to sell waste for reuse or recycling and this might encourage some companies to bring their waste to illegal dumps.

Some requirements concerning acceptance of certain types of waste to landfills may be difficult to fulfil. For instance, used lead batteries and accumulators are accepted to MSW landfills only without the liquid electrolyte. Thus, the company must remove the electrolyte into special tanks in accordance with the established requirements. This can be difficult for some companies.

Since January 1, 2009, construction projects of waste treatment sites and landfills are an object of environmental review and, therefore, an Environmental

Impact Assessment (EIA) must be carried out. Due to law amendments in 2007, the environmental review only checks the compliance of a project to technical regulations.

In some cases there are differences between the actually built landfills and design project documentation (part of construction permit). The differences between the actually built facilities and the design project documentation are a problem of law enforcement rather than of the legislation.

There are no administrative procedures for closure of hazardous waste sites or requirements for after-closure monitoring. There are no direct provisions for responsibility of waste site operator/owner for adverse environmental impacts caused by a closed and an abandoned landfill.

For waste incineration facilities emission limit values of flue gases are defined case by case based on calculations taking into account limit value of ambient air quality at the border of sanitary zone. Therefore the emission limit values of flue gases are not based on BAT (best available technologies). According to some authorities the emission limit values are so strict that they can not be met with current technology. One way to meet the air quality standards is to extend the emission height and dilution, which does not reduce the emission at all.

## 8.6 Gaps in overall HW management system

The legislation does not stipulate any provisions for design and adoption of federal target programs in the field of environment protection (such programs are used as an official way to plan and fund relevant state operations), including those for solving HWM problems. Earlier, a Federal Target Program entitled "Waste" was in force, which was based on the article 15 of the Federal Law on Environment Protection.

To obtain a relevant waste license special certificates confirming professional qualifications of the individual entrepreneur or employees of the legal entity who are in charge of hazardous waste operations need to be presented to state authorities. The process of obtaining such certificate implies a training component and then later on examination at the relevant branch of Rostekhnadzor in order to be completed. The process of getting such certificates is rather complicated and, sometimes, expensive for small companies.

It is difficult to ensure environmentally sound management of hazardous waste as long as waste burial is allowed in cases where it does not threaten the groundwater quality.

## 9 THE ANTICIPATED CHANGES IN THE RUSSIAN LAWS

This chapter on the anticipated changes in the Russian laws on environmental protection and hazardous waste management is based on multiple sources: the adopted but not yet effective amendments to core laws, the federal target program entitled "The National System for Chemical and Biological Safety of the Russian Federation (2009 - 2013)"<sup>32</sup>, a set of measures taken by the Russian government for environment protection as concerns ecological and radiation safety<sup>33</sup>, and analysis of data from hearings on environmental safety at the Russian State Duma.

1. According to the Federal Law "On production and consumption waste" dated 30.12.2008 N 309-FZ, effective from January 1, 2010, a new clause 7 will be added to the article 12 as follows: "It is prohibited to dispose waste at facilities that are not included on the state register of waste disposal facilities." Therefore, a regulation on the order of registry keeping and requirements to landfills that will be put on that register must be prepared and adopted by *January 1, 2010*.

2. As the term *hazardous waste* is deleted from FL "On waste...", new Criteria for assigning certain hazard classes to waste may appear.

3. Regarding fee setting system in the environment protection sector, it is expected that a draft law will be prepared on amending legal acts of the Russian Federation in the part of transition to common principles for establishment of allowed environmental impact norms (November 2009, up to 2 years to enter in force). This will affect the system of setting the waste disposal fee, the fee for emissions and discharges from landfills, fines, and other punishment for damaging the environment.

4. Regarding the fee for negative impact on the environment, it is expected that a draft law will be prepared on amending legal acts of the Russian Federation in the part of implementation of measures for economic incentives of business entities that apply the best available technologies (*November 2009, up to 2 years to enter in force*). In general, the fee for pollution (emissions and discharges) and damage compensation in case of unauthorized dumps are expected to increase.

5. Classification of types of economic activity and environment protection costs is expected to be designed in

<sup>32</sup> Adopted by the Russian Government Order of October 27, 2008, N 791

<sup>33</sup> Adopted by the Russian Government Order of October 18, 2009, N 1166-r

accordance with the international standards (*December 2009*).

6. In the framework of the implementation of the federal target program entitled “The National System for Chemical and Biological Safety of the Russian Federation (2009 - 2013),” a number of important measures are planned (not in relation to legal regulation):

- Design of technologies for destruction of various chemical hazardous waste including those kept in collectors, dumps, and burial sites including those without an owner or not in compliance with the safety requirements. Technologies will be designed for destruction of hazardous industrial waste, new analytical methods will be designed and tested, and a set of experimental plants will be created and tested.
- Scientific substantiation and design of a system for safe treatment of medical waste in the Russian Federation with use of modern technologies. A system for safe treatment of medical waste in the Russian Federation must be designed and implemented based on deactivation technologies with account taken of the features of individual regions.
- It is planned to establish federal centers in design of safe technologies for destruction of chemically hazardous waste, and technical modernization of certain galvanic, acid, chlorine, and ammonia production facilities.

7. Support for companies engaged in sorting, deactivation, advanced processing, and disposal of waste, which would modernize operation to low-waste and resource-efficient technologies are stipulated in the draft laws “On energy saving and raising the energy efficiency” and “On amendments to certain legal acts of the Russian Federation in view of raising the energy and environmental efficiency of the Russian economy,” which are currently reviewed by the State Duma. In particular, for companies which invest in the implementation of such technologies there will be economic incentives: (tax exemptions, exemptions from the fee for negative environmental impact, and budget subsidies (*the time of adoption is unknown*)).

## 10 COMPARISON OF RELEVANT EU LEGISLATION AND RUSSIAN LEGISLATION

The purpose of this chapter is to describe the legislative approaches to hazardous waste management in the EU and Russian Federation.

### 10.1 General Principles and Requirement

The EU legislation provides a framework and minimum requirements for the hazardous waste legislation in the member states. Waste management – including hazardous waste management – is based on the following principles:

- **Prevention.** Waste management strategies shall aim at preventing generation of waste and reducing their harmful impacts;
- **Polluter pays.** The producers of waste take responsibility of the cost of waste management;
- **Producer Responsibility.** Manufacturer of products and/or importer bears the responsibility of waste management upon articles becoming waste, instead of waste producer (certain product groups, e.g. batteries and accumulators);
- **Precautionary Responsibility.** Potential problems related to waste and waste management should be avoided and anticipated;
- **Proximity.** Waste should be disposed of near to their source.

**All waste that could be harmful to health or environment through their inherent chemical or other properties is classified as hazardous waste.** Based on the properties and categories of waste EU maintains a list of hazardous wastes, on which the national legislation in the member states is based on. In addition, some specific articles have been considered as hazardous waste through specific legislation (electronic waste). Examples of hazardous wastes are solvents, paints, batteries, fluorescent lamps, refrigerators, electronic waste, medical waste, waste oil, sludge from wastewater treatment of electroplating industry etc.

There are additional requirements and obligations in EU for management of hazardous wastes in addition to the applicable requirements of all wastes in general. It is the responsibility of the waste generator to find out if the waste generated needs to be managed as hazardous waste.



In Russia the principles of waste management are partially similar. The principles «Polluter pays» and «Prevention» have been established (the latter in the wording “using most recent scientific and technological research in order to achieve reduced waste and zero-waste technologies”) and are used. The main principle is “the protection of human health, sustaining or restoration of the favorable state of environment and preservation of biological diversity”.

In Russia the responsibility for waste management is completely passed to waste producer. The manufacturers and importers of products have no responsibility for waste management of any articles upon them becoming waste. Hence the costs of waste management are not necessarily included in the price of the products (e.g. recycling fee in new car tyres, oil filters and electronics in the EU).

In Russia all waste is classified into five classes depending of their hazard. Only class V waste is considered “practically non-hazardous”; class I-IV waste is hazardous. The state operates the classification catalogue of types of waste and relevant procedures, which allow attributing any waste to a certain class. Similarly to the EU, it is in the responsibilities of enterprises to define the hazard class for every single type of waste produced. The hazard class in turn sets requirements for the waste management.

The examples of class I hazardous waste are substances and units containing mercury, lead in some forms, arsenic, polychlorinated biphenyls and terphenyls, waste containing 6-valent chromium (about 20 entries, listed directly in the catalogue).

Class II waste include “lead containing” waste, lead-acid batteries, battery acid and alkali, halogen-containing oils, etc. (also about 20 entries).

Class III includes waste containing copper, zinc, lead, remnants of silicon oils or diesel fuel, contaminated organic substances, fresh manure, contaminated sands, dust of various kinds, etc (about 115 entries).

Russians legislation does not impose special requirements for handling hazardous waste depending on their class, except those to the landfills. However, the fee for waste disposal depends on the class of hazard significantly. Citizens (households), as well as organizations that produce only “domestic-like” municipal solid waste (institutions, offices, etc.) do not have responsibility to collect hazardous waste separately. Powers of government are divided on the powers in the treatment of household waste and authority in the field of industrial waste treatment without reference to hazardous classes.

Hazardous waste management in EU includes the following steps:

- **Separate collection.** Mixing hazardous waste with municipal solid waste, non-hazardous waste or other hazardous waste types is prohibited. It is the responsibility of municipalities to organize collecting points for hazardous waste for citizens.
- **Storage and packaging.** Waste shall be labelled and marked according to the requirements of the legislation for storage and transportation. Waste shall be packed so that it does not cause danger and that it can be treated. Book keeping is expected from those industrial facilities which need an environmental permit for their operation.
- **Labelling.** At least the following information is needed: name of the waste and the holder, hazardous properties (if any), transportation and treatment information.
- **Transportation.** The main instrument is ADR:UN agreement on transportation of dangerous goods on road. Documentation containing all necessary information of waste (specified in the legislation) follows the waste during transportation (transportation document). Unknown waste can not be transported.
- **Treatment.** Waste can be transported only to approved receipt and there incoming waste shall be identified and recorded. Hazardous waste can be disposed at a landfill only if it is designed for disposal of hazardous waste (C.f. next chapter). It is the responsibility of the landfill operator the check that the incoming waste corresponds the waste transportation documents and that in the environmental permit that waste type is allowed to be disposed at the landfill. If needed the landfill operator may take samples of waste for check.
- **Reporting.** In Russia special requirements for hazardous waste management are established to the waste management process in general. Important elements of the system are licensing of hazardous waste management (all phases: collection, storage, use, deactivation, transportation, disposal) and reporting.

Separate collection of hazardous wastes and wastes of different hazardous classes is not required in Russian legislation, except for medical waste. It is assumed that enterprises are economically stimulated not to mix wastes of different classes in order not to increase fees for disposal. The fee is higher for the more dangerous classes. Waste of I-II hazard class may not be mixed with municipal waste.

Requirements for packaging and labelling of hazardous waste are not specifically established and are regulated in the context of the requirements for temporary storage of waste, transportation or disposal. With regard to transportation the requirements of ADR are used, same as in EU.

If waste is reused the buyer of waste (waste user) must have a license for waste management.

In Russia landfills are classified depending on the type of waste accepted as municipal landfills, III-IV class waste landfills, I-II class waste landfills and mixed. Waste of I-II hazard class can not be mixed with municipal waste. The environmental monitoring obligations of the landfill owner/operator are not directly prescribed, but they must have process control and report its results to authorities.

## 10.2 Requirements on Landfills

This overview provides a short comparison of requirements for landfills in EU and in Russia. The comparison is based on "Council directive 1999/31/EC on the landfill of waste" (EU), "SNiP 2.01.28-85, Landfills for deactivation and burial of toxic industrial waste. General provisions on designing" (Russia) and SNiPN 2.1.7.1322-03 "Sanitary-epidemiological rules and norms" (Russia).

### *General requirements*

In the EU depositing liquid waste, explosive waste, corrosive waste, oxidative waste, highly flammable or flammable waste or hospital and other clinical waste with risk of infection at a landfill is prohibited. In Russia depositing liquid waste at a landfill is possible, but reducing water content before disposal is recommended. Chemically active substances must be stabilized prior to disposal. Flammable substances have to be burned and used for heat generation. Some types of medical waste should also be treated by incineration only.

In the EU landfill operation requires an environmental permit. The application for such a permit shall include information on types and total quantity of waste to be deposited, pollution prevention measures, operation, monitoring plan and a plan of landfill closure. In Russia landfills operate under same conditions as any other enterprise.

They require environmental review conclusion on the design documentation before construction and a permit, which quantifies allowed discharges and emissions during operation. Above that they need a license to handle hazardous waste, but it specifies only types and classes of waste allowed for handling.

There are three classes of landfills:

- landfills for hazardous waste;
- landfills for non-hazardous waste; and
- landfills for inert waste.

In the EU hazardous waste can only be deposited on a landfill that is classified as hazardous waste landfill. In unclear cases a laboratory test for suitability of landfilling shall be carried out.

In Russia formally there are two types of landfills:

- municipal solid waste landfills; and
- hazardous waste landfills.

Hazardous waste landfills may specialise in hazardous waste classes I-II, or III-IV, or other combination. Municipal solid waste landfill can contain up to 30 % of waste hazard classes III-IV.

In EU a adequate provision, by way of a financial security or other equivalent, shall be made by the landfill owner or operator prior to commencement of disposal operations. This is to ensure that obligations including after-care provisions are discharged.

### *Technical requirements*

In the EU hazardous waste landfills shall be equipped with special base and bottom sealing to prevent contamination of soil or groundwater. The landfill bottom base and sides shall consist of mineral layer with permeability max.  $1,0 \times 10^{-9}$  m/s and the thickness at least 5 meters. If the natural soil of the landfill does not meet the permeability and thickness requirements it can be completed artificially and reinforced by other means giving at least the equivalent protection of combined effect. An artificially established geological barrier should be at least 0,5 meters thick. In addition to the geological barrier described above, an artificial sealing liner and a drainage layer at least 0,5 meters thick must be constructed to the bottom of hazardous waste landfill.

In Russia the maximum permeability values for bases of landfills for toxic industrial waste are as follows:

- insoluble substances of waste of hazard class I and soluble substances of hazard classes II and III:  $1,0 \times 10^{-10}$  m/s
- insoluble substances of waste of hazard classes II and III:  $1,0 \times 10^{-9}$  m/s.



If the permeability of the soil at the landfill exceeds the above-mentioned values, a protective layer of compacted clay shall be used with a thickness of at least 1 meter and maximum permeability of above values. If the permeability of soil of a landfill does not meet the requirements, different clay, bitumen, polymer concrete and asphalt structures for bottom structures can be used. The SNiP 2.01.28-85 includes detailed requirements for these structures e.g. thickness.

Two main differences in EU and Russian requirements concern an artificial sealing liner and a drainage layer. In Russia neither drainage layer nor a sealing liner is required. In practice the lack of drainage layer means potentially increased leaching of harmful substances of waste and reduced possibilities to collect leachate for treatment.

The EU requirement for permeability  $1,0 \times 10^{-9}$  m/s for 5 meters corresponds to  $6,0 \times 10^{-10}$  m/s for one meter. The EU legislation also requires installing artificial liner further reducing permeability. Therefore it is not possible to say if the Russian or the EU requirement is stricter concerning permeability.

#### *Leachate control*

In the EU leachate shall be collected and treated at the landfill or discharged for further treatment outside the landfill. Leachate shall not be mixed with clean surface waters of the landfill or external surface waters outside of the landfill. Waste must not get in contact with groundwater.

In Russia requirements for collection and treatment of leachate and surface waters are the same as in the EU. Both clean surface waters and groundwater outside the landfill shall not be mixed with landfill run-off waters. Treatment of contaminated run-off waters from landfill is required both in EU and Russia.

#### *Cover and closure*

When the landfill has reached the final height, the EU legislation requires building a surface sealing. It shall include as minimum the following layers:

- top layer 1 m
- drainage layer >0,5 m
- mineral sealing layer
- artificial layer.

In Russia when a landfill has reached a final height an insulating layer of soil shall be made. Main differences

of the Russian requirements compared to EU requirements are that no drainage layer or artificial layer is required when covering a landfill.

In the EU a landfill is considered as closed after the authority has carried out a final on-site inspection, has assessed all the reports submitted by the operator and has communicated to the operator its approval for the closure. After a landfill has been closed the operator shall be responsible for its maintenance and control in the after-care phase as long as may be required by the authority. Russian legislation does not provide for exact procedures for closure.

#### *Monitoring*

According to the EU requirements the landfill operator shall carry out regular monitoring as specified in Directive 1999/31/EC and report the results to the competent authority. The operator shall be responsible for carrying out monitoring after closure of a landfill for a period as required by the authority. For example in Finland monitoring is required typically at least for 30 years after closure.

Regarding leachate and surface water monitoring the frequency of sampling is as presented below:

	Operating phase	After-closure phase
Leachate volume	monthly	every six months
Leachate composition	quarterly	every six months
Volume and composition of surface water	quarterly	every six months

Russian legislation does not contain exact provisions for leachate or surface water monitoring, only for the sites of monitoring. Monitoring is based on the process control documents, developed by the operator and adopted by the competent authority. In addition there are no obligations stipulated for the after-closure phase.

### **10.3 Incineration of Hazardous Waste**

In EU hazardous waste incineration is strictly regulated and requires an environmental permit. The stringent operating conditions, including emission limit values for flue gases of waste incineration are set specifically in the Directive 2000/76/EC on the incineration of waste.

In Russia emissions are regulated indirectly through ambient air concentrations for certain facility types. The maximum allowed emission is based on dispersion modelling to meet the ambient air quality requirements. The approaches are different and comparison is difficult. The EU approach is clearly an emission based end-of-stack approach, while the Russian

approach is based on emission. It is possible to affect the environmental concentrations without reducing the emission, by for instance extending the stack or selecting the ambient air monitoring points carefully.

## APPENDICES

### ANNEX I: Terminology

In the Russian law there are several systems of terms for waste, and the classification principles are not the same as in EU. Direct translation of the terms leads to difficulties in understanding. For this reason, in this section the definitions of terms are provided as they are used in the next. Also the Russian terms are given.

**Hazardous waste** (Опасные отходы): hazard class I-IV waste<sup>34</sup>. Waste is attributed to a certain class either based on a list (see section 4.1), or by way of calculations or experiments. Waste that is on the European hazardous waste list is primarily in classes I and II, sometimes in class III.

Please note that in this report, the term hazardous waste is used in the meaning as applied in the Russian law. For potentially hazardous waste, which is not attributed to classes I-IV in accordance with the official procedures, the term waste with hazardous properties is applied.

**Non-hazardous waste** (Практически неопасные отходы): hazard class V waste<sup>35</sup>. A hazard class is assigned basing on many properties of the waste (toxicity, explosion and fire risk, high reactivity, content of infectious disease agents, or immediate or potential risk for human health and the environment) and depends on its physical state. For this reason, some regulations use more specific terminology<sup>36</sup>:

**Toxic waste** (токсичные отходы) covers waste containing substances, which are or may be hazardous for humans due to bioaccumulation or/and toxic impact on biotic systems if disposed of into the environment.

**Biological waste** (биологические отходы) covers biological tissues and organs generated in medical or veterinary surgery, medical and biological experiments, death of cattle and other animals and poultry, and other waste generated at processing of food and non-food raw materials of animal origin and also waste of the biotechnology industry.

<sup>34</sup> FL On waste, art. 4.1, 14, 15.

<sup>35</sup> FL On waste, art. 4.1.

<sup>36</sup> Here and further the definitions are cited from GOST 30772-2001 "Resource saving. Waste treatment. Terms and definitions" if not otherwise mentioned.

**Medical waste** (отходы здравоохранения (отходы лечебно-профилактических учреждений)) covers materials, chemicals, and products that have lost all or some of their initial consumer properties as a result of medical manipulations performed in the course of examination or treatment of people at healthcare institutions.

In distinguishing the competencies and powers of government bodies in the area of waste treatment organization, a different system of terms is applied:

**Domestic (household) waste**<sup>37</sup> (бытовые отходы и мусор, твёрдые бытовые отходы, ТБО) is consumption waste generated by households.<sup>38</sup>

**Industrial waste** (промышленные отходы) is solid waste generated as a result of chemical and thermal processing of natural materials<sup>39</sup>.

In the last years, “domestic” waste has sometimes been understood as not just household waste but also waste generated by offices, shops, small industrial enterprises, schools, hospitals, and other municipal entities. For this waste, the term **municipal solid waste (MSW)** (муниципальные отходы) is frequently applied.

The term municipal solid waste is used in this report for designation of the respective landfills only (MSW landfills) and is not fully equivalent to domestic (household) waste. In Europe, the term municipal solid waste implies that there is no hazardous waste.

In Russia, domestic waste could be contaminated with hazardous substances, as there is no procedure for separate collection of potentially hazardous garbage. Moreover, hazard class III-IV waste is allowed to be buried at landfills for MSW.

#### Waste disposal sites:

**Illegal dumping site** (несанкционированные свалки отходов): Places that are used for waste dumping but not designated for that purpose.

**Dumping site** (свалка): Location of waste which is not planned for reuse in the foreseeable period.

**Landfill** (полигон захоронения отходов): A fenced area designated and, if necessary, specially equipped for waste burial and for removing the chance of buried waste affecting unprotected people and the environment. “Polygons” for toxic waste should be equipped with incinerators and other treatment facilities, thus the term “**waste treatment site**” could also be applied.

<sup>37</sup> FL On waste, art. 8.

<sup>38</sup> GOST 30772-2001 “Resource saving. Waste treatment. Terms and definitions”

<sup>39</sup> GOST 25100-95 “Soils. Classification”

## **ANNEX II: Abbreviated Names of Laws And Regulations**

**FL on Waste** - Federal Law on Production and Consumption Waste, 1998 No.89-FZ.

**FL on Environment Protection** - Federal Law "On Environment Protection" 2002 No.7-FZ.

**FL on ER** – Federal Law "on Environmental Review" 1995 No. 174-FZ

**FL on Protection of Legal Entities' Rights** - Federal Law "On Protection of the Rights of Legal entities and Individual Entrepreneurs at State and Municipal Control (Supervision)" 2009 No.294-FZ.

**FL on Sanitary-Epidemiological Well-Being** - Federal Law "On sanitary-epidemiological well-being of the population" 1999 No.52-FZ.

**FL on Technical Regulation** – Federal Law "On Technical Regulation" 2002 N 184-FZ.

**FL on Licensing** - Federal Law "On licensing of certain types of activity" 2001 N 128-FZ.

**LC RF** – the Land Code of the Russian Federation 2001 No.136-FZ.

**KoAP RF** – the Code of Administrative Offenses of the Russian Federation 2002 No.195-FZ.

**CC RF** - the Civil Code of the Russian Federation 1994 N 51-FZ (ГК РФ).

**GrK RF**- the Urban Planning Code of the Russian Federation 2004 N 190-FZ.

**UK RF** - the Criminal Code of the Russian Federation 1996 N 63-FZ.

**"Rules of Design of Norms and Limits"** - "Rules of Design and Adoption of Drafts of Waste Generation Norms and Limits for their Disposal" (Russian Government Order of 16.06.2000 N 461).

**"Determining the Hazard Class of Toxic Waste"**. Sanitary regulations 2.1.7.1386–03 of 16.06.2003

**"Harmful Substances"** - GOST 12.1.007-76 "Harmful Substances. Classification and General Safety Requirements" of 10.03.1976

**"On Payment Norms"** to surface and ground water bodies, disposal of production and consumption waste." Russian Government Order of 12.06.2003 N 344.

**"Fee Calculation Order"** - Order of Calculation of the Fee and its Maximum Size for Pollution of Environment, Waste Dumping, and Other Kinds of Harmful Impact (Russian Government Order of 28.08.1992 N 632).

**"2-TP Instruction"** – "Order of Completion and Presentation of the State Statistical Monitoring form N 2-TP (waste) "Information on generation, use, deactivation, handling, and disposal of production and consumption waste" (order of the Russian State Statistics Committee of 17.01.2005 N 1).

**"On Implementation of Environmental Control"** - Russian Government Order "On implementation of state control in the environment protection area (state environmental control) of 27.01.2009 No.53.

**"Methodical Instructions on Norms and Limits** – "Methodical Instructions on Design of Draft of Waste Generation Norms and Limits for their Disposal". Order of the Federal Service for Environmental, Technological, and Nuclear Supervision N 703 of 19.10.2007

**"Statute on Licensing"** - **Russian Government Order** N 524 of 26.08.2006 "On Adoption of the Statute on Licensing of Collection, Use, Deactivation, Handling, and Disposal of Hazardous Waste."

**"Instruction on MSW Landfills"** - Instruction on design, operation, and reclamation of landfills for municipal solid waste, adopted by Gosstroy in 1996

**"Passport Instruction"** – Instruction on Completing the Form of Hazardous Waste Passport (Order of the Ministry of Natural Resources of Russia 02.12.2002 N 785 "On Adoption of Hazardous Waste Passport").

**Rosprirodnadzor Statute** - Statute on the Federal Service for Supervision in Nature Use and Environment (Russian Government Order of 30.07.2004 N 400

**Rostekhnadzor Statute** - Statute on the Federal Service for Environmental, Technological, and Nuclear Supervision (Russian Government Order of 30.07.2004 N 401).

**Rospotrebnadzor Statute** - Statute on the Federal Service for Supervision in Protection of Consumer Rights and Human Wellbeing (Russian Government Order of 30.06.2004 N 322).

**“On the Federal List”** – “On the list of objects subject to federal state environmental control” (Russian Government Order of 31.03.2009 N 285).

**“Criteria of Classes of Hazardous Waste”** – “Criteria of Assignment of Classes of Hazard for the Environment of Hazardous Waste” (Order of the Ministry of Natural Resources of Russia of 15.06.2001 N 511).

**SanPiN “Requirements to Disposal”** – Order of the Chief Sanitary Inspector of Russia of April 30, 2003, N 80, “On Enactment of sanitary-epidemiological regulations and norms, SanPiN 2.1.7.1322-03 Hygienic requirements to disposal and deactivation of production and consumption waste).

**SanPiN 2.1.7-95** Soil, cleaning of inhabited areas, domestic and industrial waste, sanitary protection of soils. Order of storage, transaction, burial, and disposal of (toxic) industrial waste.

**SNiP 2.01.28-85.**“Landfills for deactivation and burial or toxic industrial waste. General provisions on designing (USSR Gosstroy order of 26.06.1985 N 98).

### **ANNEX III: GOST List**

GOST R 52108-2003 Resource saving. Waste treatment. General provisions. Russian Gosstandart Order of 03.07.2003 N 236-st. GOST R of 03.07.2003 N 52108-2003

GOST 30772-2001 Resource saving. Waste treatment. Terms and definitions.

GOST 30773-2001 Resource saving. Waste treatment. Process cycle stages. General provisions.

GOST R 51750-2001 Power saving. Method for determining power capacity at product making and service rendering in technical power systems. General provisions.

GOST R 51769-2001 Resource saving. Waste treatment. Documenting and regulation of pcs management. General provisions

GOST 30774-2001 Resource saving. Waste treatment. Waste hazard passport. Basic requirements.

GOST 30775-2001 Resource saving. Waste treatment. Classification, identification, and coding of waste. General provisions

## ANNEX IV: Requirements of Toxic Waste Landfills

### General requirements<sup>40</sup> to toxic<sup>41</sup> waste landfills

The only waste allowed to special landfills is toxic industrial waste of classes I, II, III, and, if necessary, IV, the lists of which shall in each specific case be approved by the authorities and agencies of the sanitary-epidemiological and utility services, the customer, and the designer of the landfill project. Solid industrial waste of hazard class IV may be taken to urban municipal waste landfills and used as an insulation inert material in the top and middle part of landfill plots. Industrial waste of class IV may be taken to landfills for toxic industrial waste if there is a relevant feasibility evaluation. Industrial waste that is allowed for storage together with MSW may not be explosive or self-ignitable, and its humidity may not exceed 85%. The types of industrial waste allowed to be stored at MSW landfills are listed in the appendix 1 to **SanPiN 2.1.7-95**.

Liquid toxic industrial waste shall be dehydrated at factories before it is taken to landfills. Liquid toxic waste may only be received at landfills if it comes from industrial enterprises where its dehydration is not rational, and this has been proved by a feasibility study.

The following types of waste **shall not be** received at landfills:

- a. waste, for which efficient methods for extraction of metals and other substances do exist (absence of utilization and treatment methods shall in each specific case be confirmed by relevant ministries or agencies);
- b. radioactive waste;
- c. oil products subject to regeneration.

Landfills are built to receive waste to plots for at least 2 years and to bunkers for at least 5 years (up to 20-25 years according to **SanPiN 2.1.7-95**). Pesticides may be buried at landfills in an amount not exceeding 300 tons. Pesticides may be buried depending on their hazard class together with other waste.

A HW landfill must include a waste deactivation (incineration) section.

### Requirements on the design of toxic waste landfills include:

- requirements to fencings;
- requirements to the canal surrounding the landfill (to remove outer water);

- requirements to design of the ring road;
- requirements to evaporation ponds for evaporation of atmospheric precipitation falling on the burial area.

Depending on ground water location and filtering properties of soils either drainage or various impermeable screens (bottom structures) shall be applied taking into account wastewater hazard class. The drainage design shall be dependent on the properties of soil where the site is located.

The types and structures of impermeable screens are listed in a special appendix to SNiP, which has a reference (i.e. non-compulsory) status. The types and structures are to be chosen depending on the hazard class of rain and drainage waters in evaporation ponds and the hazard class of dry wastes. Various designs of soil, concrete, ferroconcrete, asphalt concrete, asphalt polymer concrete, and film screens are provided.

### General requirements to methods of hazardous waste deactivation:

Incineration with heat recovery is recommended as the basic method. Non-combustible waste shall be buried after neutralization (deactivation). The burial method depends on the toxicity (hazard class) and water solubility of the waste. Paste like waste containing water-soluble substances of hazard class I shall be submitted for burial in metallic containers. Waste of different types shall be buried separately on special plots on the site. The size of plots for waste burial is not prescribed. The plot volume shall enable waste receipt for burial for no more than 2 years.

For 13 waste types, recommendations (performance is voluntary) are provided regarding methods of processing with consideration of their physical state.

- 1) Galvanic waste (sub acid or alkaline, containing metal salts or hydroxides)
- 2) Slurry sludges of treatment plants (Same, containing mineral salts, metal salts or hydroxides)
- 3) Containing arsenic:

<sup>40</sup> Here and further the requirements are listed as of SNiP 2.01.28-85. "Landfills for deactivation and burial or toxic industrial waste. General provisions on designing (USSR Gosstroy order of 26.06.1985 N 98) if no other document mentioned .

<sup>41</sup> This document regulates only construction of toxic waste landfills, not including radioactive and other hazardous waste landfill design.



liquid (Arsenic and arsenous anhydrides and other arsenic compounds mixed with other salts)

solid and resinous (Arsenic salts)

4) Containing nitriles (Nitriles and other salts)

5) Organic combustibles:

a. solid (Cleaning cloth; dirty sawdust; waste cloth; contaminated wooden packing; solid resins; mastics; oily paper and packing; cuts of plastic and organic glass; remnants of paints and varnishes; pesticides)

b. liquid (Liquid oil products that cannot be regenerated; oils; contaminated solvents; dirty petrol, kerosene, oil, and fuel oil)

c. paste like (Contaminated varnishes, enamels, resins, paints, oils and lubricants)

6) Liquid organic combustible that contain chlorine (at least 40 %) (Contaminated solvents, still bottoms)

7) Wastewater (only wastewater which cannot technically be deactivated by existing physical, chemical, and biological methods) (Sub acid or alkaline solutions containing organic and mineral salts or substances)

8) Galvanic waste (Mix of metal salts or hydroxides)

9) Mercury containing waste (Faulty mercury arc and luminescent lamps)

10) Sand contaminated with oil products (Sand and oil products)

11) Molding sand (Land polluted with organic waste)

12) Spoiled and unmarked gas cylinders (Spoiled gas cylinders with remnants of substances)

13) Strong poisons (Arsenic and arsenous anhydrides, mercury bichloride, salts of hydrocyanic acid, salts of nitrile acrylic acid).

Requirements to thermal deactivation (incineration) include:

- Structure of incinerators and other devices in a workshop, availability of grinders for big pieces of waste;

- requirements to incinerator design (possibility of burning solid, liquid, and paste like waste in packing, changes of waste composition in the future, etc.);

- temperature conditions that incinerators must provide;

- availability of an afterburner and requirements to it;

- availability of a waste heat boiler after the afterburner and requirements to it (including those about the temperature conditions);

- wet stage of gas cleaning if there are substances in industrial waste that have a high steam pressure at a temperature of 150 to 300 °C (oxides of arsenic, selenium, and phosphorus, and chlorides of antimony, arsenic, iron, lead, cadmium, bismuth, etc.)

Special requirements (incinerator design, their temperature conditions, gas cleaning methods, etc.) are given for:

- thermal deactivation of wastewater and liquid chlororganic waste;
- physical and chemical deactivation of solid and liquid non-combustible waste.

**Requirements to toxic waste burial include:**

- requirements on design of impervious screens (bottom structures) and plot slopes depending on the waste hazard class, water solubility, and filtering properties of soil where the plot is located;
- requirements to waste disposal onto plots depending on the hazard class including measures for prevention carrying away by wind;
- requirements to the structure of the insulation layer (cover) after the plot is filled (by a layer of local soil processed with oil or bitumen, and cement added);
- requirements to metal leak proof containers for burial of solid and paste like non-combustible water-soluble waste of hazard class I;
- requirements to bunkers for container storage.

**Requirements on organization of control over the environment condition include:**

- valves of monitoring wells (each valve must have at least two wells) in the sanitary protected area of the landfill and around evaporators of polluted precipitation and drainage water placed outside the toxic industrial waste burial area;
- recommendations on location of valves depending on the relief;
- requirements on well equipment;
- recommendations on sampling of water discharge from the ring canal.

### Requirements on closedown and reclamation of landfills

No special requirements (recommendations) on conservation and reclamation of toxic waste landfills and mortgage of closed landfills were found in the environmental law.

The only existing document is the Instruction on Design, Operation, and Reclamation of Landfills for Municipal Solid Waste<sup>42</sup>, which relates to the issue in question to a certain degree as industrial waste of hazard classes IV and III may be accepted to MSW landfills in a limited amount (no more than 30% of the MSW mass).

Recommendations on reclamation of MSW landfills include:

- a description of jobs that need to be performed for an examination of the landfill and environment and at establishment of a reclamation cover for the landfill;
- composition of the project and cost estimate documentation;
- technical chart of reclamation jobs and their detailed description.

### Application of SNiP 2.01.28-85.

SNiP is a “departmental” regulation and is applied, according to the common legal practice, at the stages of design and construction. Thus, SNiP determines constructive requirements to incinerators and other structures, but it is not a document that would set forth the rules of their operation.

At the stage of design, compliance with SNiP is checked by the state environmental review. The designer chooses one of the recommended solutions, e.g., for the impervious screen, and if the expert review

has approved the project, this solution becomes compulsory for performance. At the stage of construction and commissioning of the object, compliance with SNiP and project design that has been approved by the expert review may become subject to environmental and other control.

During operation, provisions of environmental, sanitary, and other legislation become compulsory, while SNiP becomes irrelevant. However, the effective legislation contains no detailed technical regulations for operation of toxic waste landfills, and SNiP contains norms relating to the operation stage (e.g. order of sending waste to a plot). Therefore, the question of SNiP application at the operation stage may be analyzed from the viewpoint of which agency controls its implementation.

In checks of an existing enterprise (including landfills), each agency acts within its powers and checks compliance with those requirements only that are set forth by the legislation relevant for this agency. Thus, Rospotrebnadzor authorities will be guided by **SanPiN 2.1.7-95**, which contains much less detailed requirements, and not SNiP. Rostekhnadzor could check compliance with SNiP requirements, but its powers comprise control and supervision over compliance with **industrial safety requirements** at design, construction, operation, reclamation, and liquidation of hazardous production facilities and transportation of hazardous substances at hazardous production facilities. Control over compliance with **environmental safety requirements** or other environmental requirements is not included on the list of Rostekhnadzor powers, as environmental control is a competency of Rosprirodnadzor. In its turn, Rosprirodnadzor will be guided by the environment protection law, to which SNiP does not directly relate.

Thus, the question if compliance with **SNiP 2.01.28-85** requirements at the stage of landfill operation shall be controlled is to a large extent at the discretion of officials.

<sup>42</sup> Adopted by the Order of the Ministry of Construction of the Russian Federation of November 5, 1996.

## ANNEX VI: LAW ENFORCEMENT PRACTICES IN KALININGRAD OBLAST (by Eco-Centre Ltd)

The law of Kaliningrad Oblast “on Production and Consumption Waste” of 2.11.2007 and the Degrees derived of that law regulate waste management in the Oblast. It sets the requirements for waste generation, collection, storage, transportation, handling and deactivation, and the power of government and local authorities as well as special executive authority in waste management. The law also introduces information support, regional cadastre of production and consumption waste in KO. The concepts of recycling, separate waste collection, waste sorting and waste minimisation and development of material recycling industry are also introduced in the Law.

The Government of KO is the regional executive authority in waste management. The responsibilities are distributed to several Oblast Ministries, the Ministry of Housing and Communal Services and Construction having the main responsibility. The executive authority carrying out control over waste management is the Service for Ecological Control and Supervision of the Government of KO, functioning since May 2009. On municipal and oblast level a new organisation is the Administrative-technical inspectorates that inspect the compliance and accomplishment of waste management.

The other inspection organisations are “Service for Ecological Control and Supervision of the Government of KO” and the Rospotrebnadzor. Their reports on inspections, including data of offences and sum of fines are submitted weekly to the Governor of KO. The order on the information system of waste management (ISWM) has resulted in development of the waste cadastre system by “ECAT-Kaliningrad”. The enterprises and organisations of KO, so far 200 enterprises, have joined in the information system and are reporting their waste data to the register.

The Government of KO has accepted the target programme of “Environmental improvement of the KO area” by the Degree of 30.1.2009. According to this programme incompliance of the functioning landfills with sanitary and ecological requirements, growth of number of illegal dumps and amount of illegally disposed waste are serious ecological problem in KO. This programme also deals with construction of landfills, liquidation of illegal dumps and land recultivation, and the required financing for these. Financing of mercury-containing waste handling and exploitation of the information system are provided in this programme. Another programme “Programme of measures for environmental improvement of the urban district Kaliningrad City area in 2009” is being realised. This programme contains the following activities: 1) utilisation of mercury-containing waste in municipal medical and

educational institutions, and 2) preparation of drafts of orders on collection, removal, handling and utilisation of polymeric waste and waste oil from motor transport companies.

According to federal legislation, arrangement of collection, removal, utilisation and handling of domestic and industrial waste is the responsibility of local self administration (municipal) authorities. Municipal District Head resolutions and District Deputy Board degrees set the following local tasks: lists of legal landfills for burial of domestic waste, lists of organisations dealing with removal of domestic waste, rate for domestic waste accumulation, tariffs for domestic waste removal and disposal by enterprises of housing and communal services, costs of collection, removal and utilisation of domestic waste.

In case of violation of waste management the Administrative Offence Code of the KO sets administrative liability in the form of fines. Fines can be set to inhabitants, officials or legal entities. Violation fines deal for example with collection, removal, handling and utilisation of domestic and industrial waste, providing incomplete and false information on waste or disposal of waste on inappropriate sites. Since the beginning of 2009, 5025 reports on violations of legislation in waste management have been made. The most common violations revealed by territorial Department of Rospotrebnadzor have been:

- unauthorised dumps of garbage, domestic waste and industrial waste;
- violations of operating rules for landfills of domestic waste;
- absence of arranged system for collection and removal of waste from enterprises;
- absence of separate collection of waste;
- irregular removal of domestic waste from container site.

The number of violations of landfill owners against waste management legislation since April 2009 (violation on Degree of Chief Sanitary Inspector 22.02.2008) in Rospotrebnadzor investigations were six and the average fine set was about 400 EUR/ site.

Violations against the law KoAP RF is the basis for most violations, by July 31, 2009 totally 176 fines have been set with an average fine of about 80 EUR/case. Rostechnadzor was responsible for inspection until the end June 2008, when responsibility was changed to Rospotrebnadzor. The violations revealed by Rostechnadzor from the beginning of 2006 to mid 2008 were 200 cases which is the same amount as inspections implemented. The average fine was about 120 EUR.

# ANNEX VIIa: SAMPLING POINTS IN LENINGRAD


## Sampling points coordinates

Object	Date of sampling	Geographical coordinates (WGS 84)	
		Altitude	Longitude
«Ust-Tosna»	03.11.09	59° 43' 09.4"	30° 42' 55.0"
«Primorskaya»	04.11.09	59° 59' 41.3"	30° 13' 27.2"
«Novoselki»	04.11.09	60° 03' 55.4"	30° 09' 17.6"
«Volkhonka»	05.11.09	59° 45' 01.0"	30° 16' 43.5"
Izhora river (1)	06.11.09	59° 36' 27.5"	30° 11' 57.2"
Izhora river (2)	06.11.09	59° 36' 27.2"	30° 11' 57.3"
Izhora river (3)	06.11.09	59° 36' 27.2"	30° 11' 57.3"
Izhora river (4)	06.11.09	59° 36' 27.2"	30° 11' 57.4"
Izhora river (5)	06.11.09	59° 36' 27.1"	30° 11' 57.3"

## Schemes of location of sampling points

“Ust-Tosna”



 Point for water sampling



“Primorskaya”



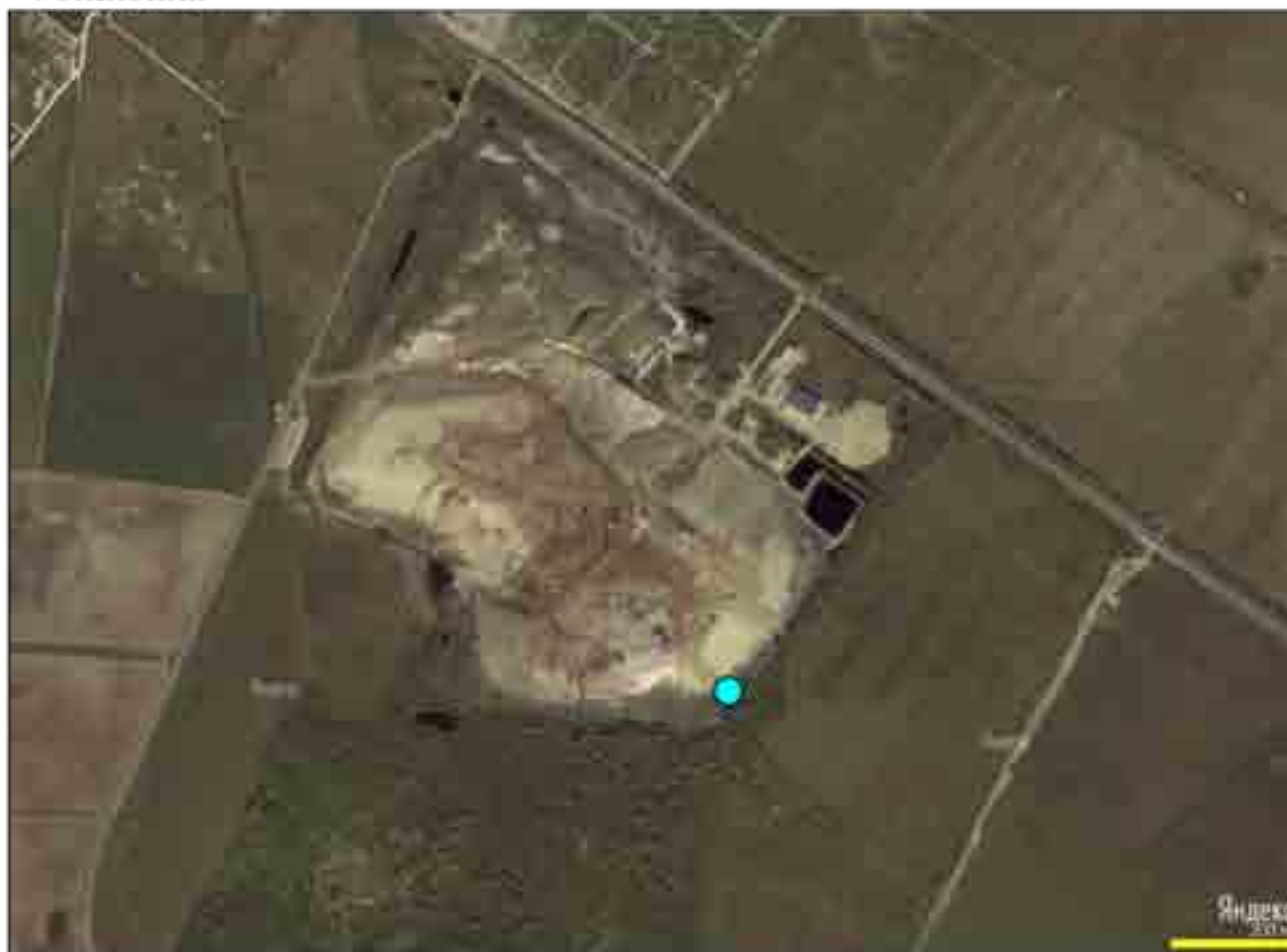
● Point for water sampling

“Novoselki”



● Point for water sampling

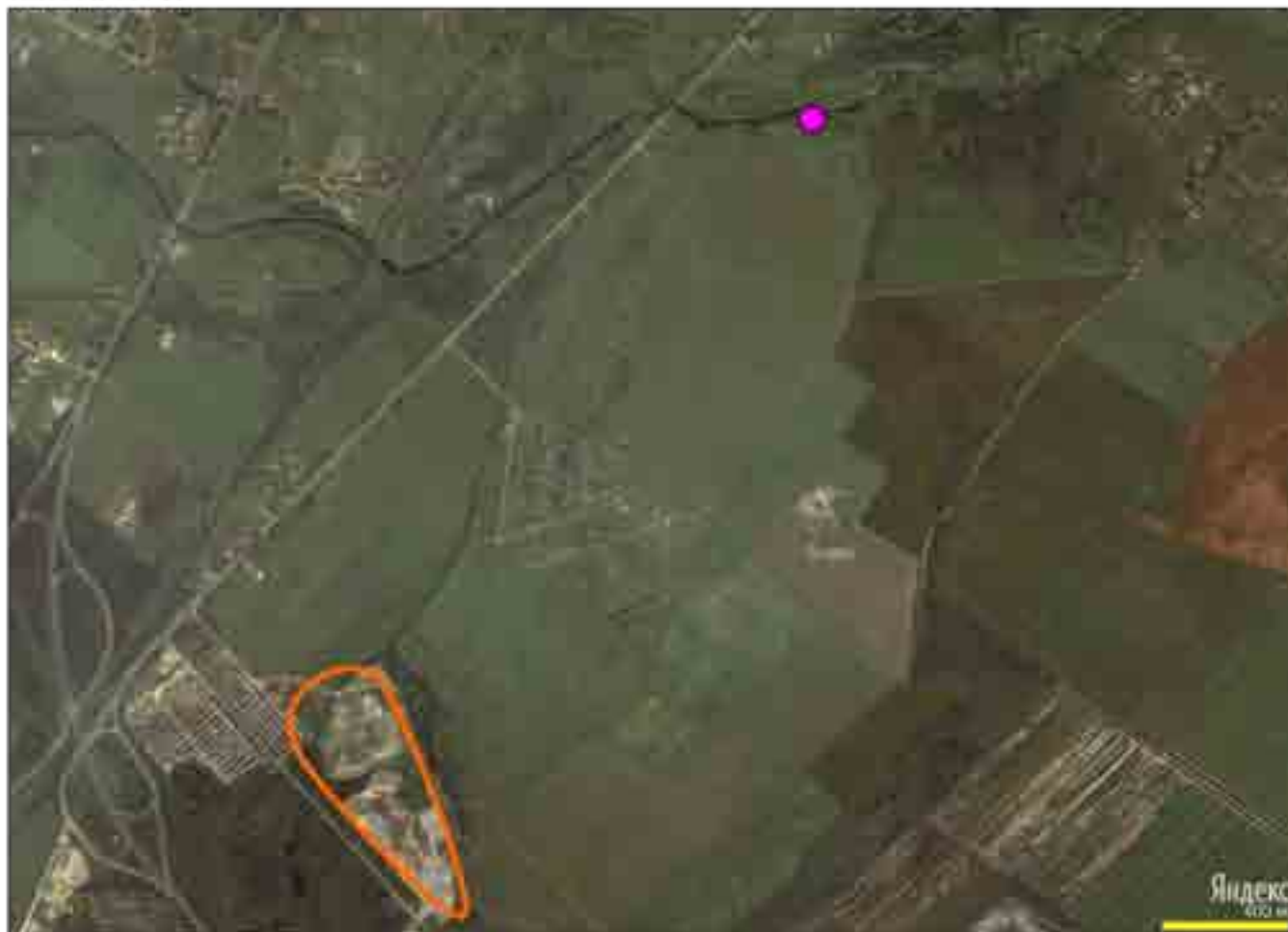
"Volkhonka"



● Point for water sampling



Izhora river








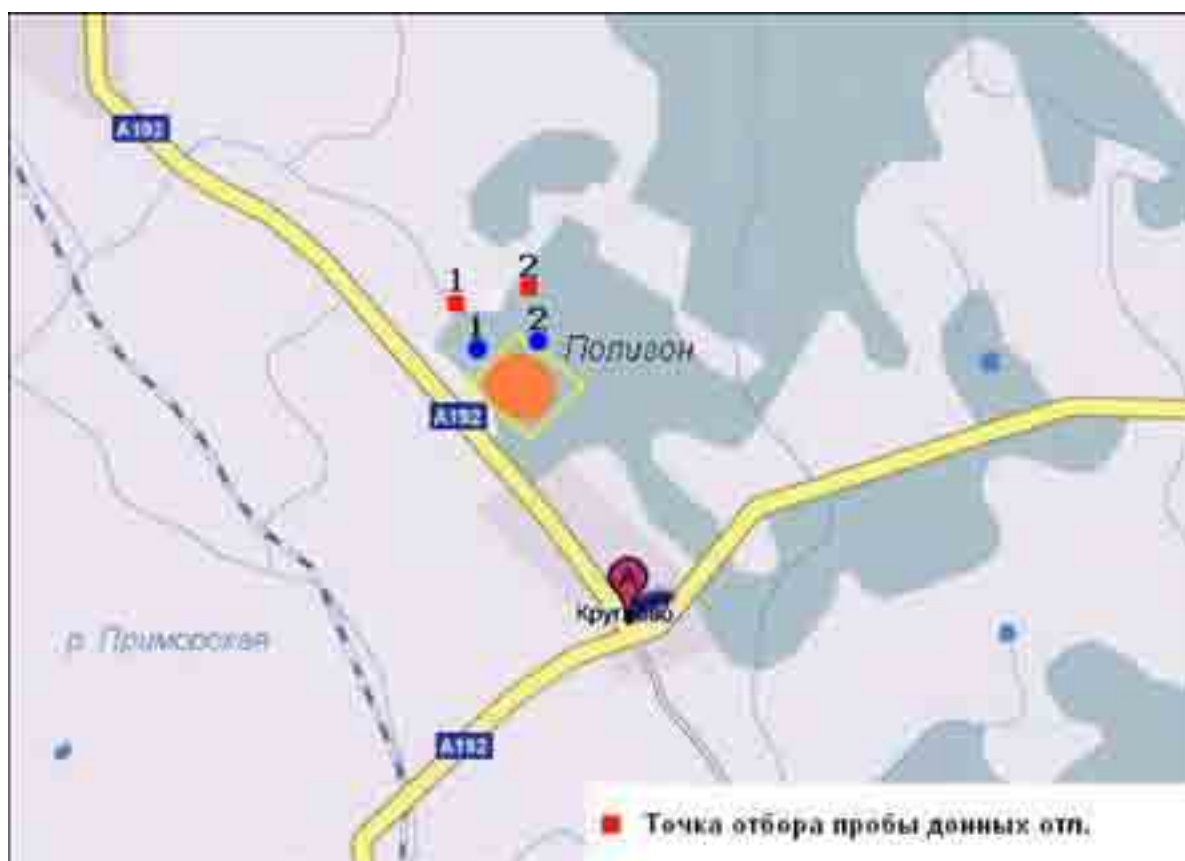
● Point for sediment sampling

○ - location of the Gatchina landfills

## **ANNEX VIIb: SAMPLING POINTS IN KALININGRAD**

**The schematic map of the location of actual sampling points in Kaliningrad Oblast**

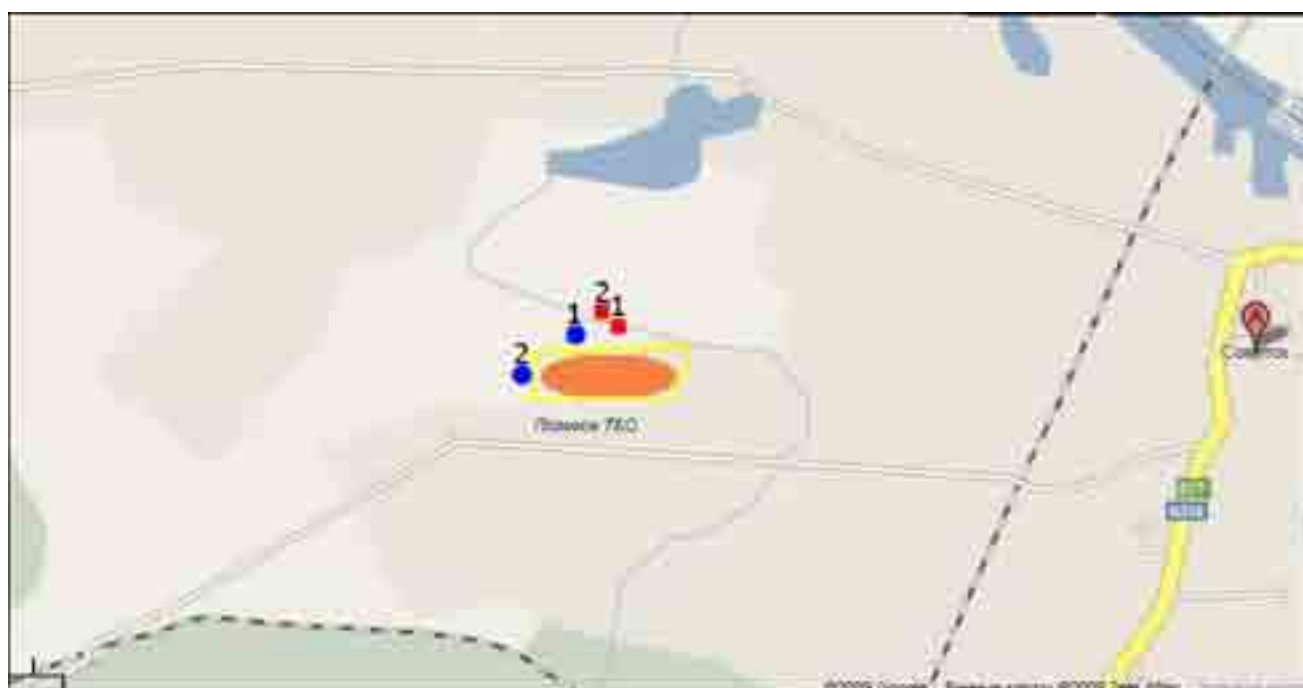
-  - Sampling point of the sediment
-  - Sampling point of filtrate
-  - The bounds of the landfill
- 1**  - Planning point for sampling
- 2**  - Actual point for sampling



Industrial and household waste landfill in Kruglovo settlement



Household waste landfill in Kosmodemyanskiy settlement



Household waste landfill in Sovetsk



Household waste landfill in Chernyahovsk



Household waste landfill in Gusev



Location of the port oil storage  
Federal State Unitary Enterprise «Kaliningrad sea fish port»

# ANNEX VIII: PILOT PROJECT PROPOSALS

Memo - February 18, 2010

HELCOM Pilot Proposals

## Introduction

This chapter provides the EU consultant's proposals for pilot cases. The pilot cases are based on the information gathered on hazardous waste hot spots and identified shortcomings in waste management measures indirectly leading to environmental contamination via inappropriate disposal measures. These project proposals have been discussed at length with local authorities and the Russian consultants involved in hazardous waste inventories, and some of them are also supported by them.

One of the essential outcomes of the hazardous waste inventory was that the available information on hazardous waste generation is neither reliable nor comprehensive. Therefore, before planning any financially sustainable environmentally sound management activities in Leningrad Oblast and St Petersburg, more information on hazardous waste types and quantities would be crucial. In these two administrative areas, main focus and higher priority should be given to landfill leachates and management of hazardous waste from industrial plants. In Kaliningrad Oblast the basic information on hazardous waste formation in enterprises reporting to the Federal authorities was not comprehensive either.

Hazardous waste from households is completely unaccounted for in all regions, although it is estimated that hazardous wastes from industry should be of higher priority due to their volumes and composition and to the industry's ability to finance waste management. Nevertheless, as landfill leachates are not collected or treated and hazardous waste from households and small enterprises continues to be landfilled along with municipal solid waste, those sources should not be forgotten.

## 1 ST PETERSBURG

The following pilot projects would reduce, either directly or indirectly, the load of hazardous substances into the Baltic Sea from St Petersburg :

- Landfill leachate reduction, collection and treatment at one representative landfill;
- Hazardous waste generation, interim storage and disposal inventory for industrial enterprises;

- Pilot project of separate collection of hazardous waste ;
- Galvanic waste treatment; and
- Feasibility/contamination study for the unauthorised Ust-Tosno landfill.

### 1.1 Landfill Leachate Reduction, Collection and Treatment

One of the priority landfills identified in the project could be selected as demonstration project. In the selection, attention should be paid to the leachate analysis results from 2009.

In the pilot project the volume of landfill leachate is estimated and the composition of hazardous compounds in leachate is investigated. The most effective action to reduce the impact of hazardous substance leachate on the Baltic Sea is to reduce the amount of water that gets into contact with waste. For this purpose, a feasibility study for the landfill operations would be recommended comprising:

- a plan for waste filling;
- precovering;
- closing of parts of the landfill gradually during the operation;
- leachate collection in a controlled way; and
- leachate treatment.

The aim of the filling and precovering plan is to keep the open waste fill area as small as possible and to keep clean rain water away from waste. The amount of leachate can be reduced more effectively by closing some parts of the landfill gradually than by precovering. The costs of closing the landfill would also be distributed over a longer period. A tailored guidance document for leachate-minimising landfill operations could be developed during this demonstration project, and this guidance document could also be applied in other landfills in Russia as need be.

Leachate collection can be carried out using open trench, underdrain around the landfill and structures that prevent leachate runoff. Leachate treatment depends on the substances contained in the leachate and will be chosen based on its quality, which will be studied as the first action of the pilot case. The minimum treatment of leachate is clarification and



equalising of water flow by sedimentation and oil removal. By clarification solids and contaminants attached to solid materials can be removed. However, it is worth noting that the Russian Federation does not have any certified technology for leachate treatment, which would be an additional task and benefit of this pilot project.

#### *Benefit to the Baltic Sea*

The benefit of this project to the Baltic Sea is the reduced amounts of leachate and dissolved hazardous substances from a landfill to the Baltic Sea. Novoselki and Volkhonka landfills produce approximately 200 000 m<sup>3</sup> leachate a year – a substantial amount of polluted water (as the screening results in the inventory show) in the Baltic Sea catchment area. Once a conceptual solution has been developed in this pilot project, the same principles can be applied in other similar cases. The proposal guidance document is intended to facilitate this replication of the concept. In addition, if the leachate treatment technology is certified (not necessary for a short-term pilot project), it will facilitate any further leachate treatment activity in the whole country.

#### *Time requirement for implementation*

The required time for implementation of leachate collection and treatment is estimated at 12–15 months. Actions needed are a feasibility study, construction design, selection of contractor, construction and commissioning. Applying for technical approvals for leachate treatment technology will take several months as well.

#### *Implementability*

This pilot project could be carried out in the same way in all priority regions. It would appear that the illegal Ust-Tosno is the only potential site for this activity, as the St Petersburg Environment Committee considers that this pilot project is possible to realise only at a landfill with favourable management, or Ust-Tosno. St Petersburg landfills Novoselki, Primorskaya and Zavod Kozitskogo, in turn, appear difficult for the implementation of this pilot project: According to the authorities, Primorskaya dump produces little leachate as it is covered, and Kozitskogo will become a construction site in a few years, which would prevent any long-term activity on the site.

Leachate treatment would stop as soon as BaltHazAr funding end, unless supported financially by the landfill owners or the City. Nevertheless, valuable experience would be received of technical solutions, costs and practical management of treatment, which would be valuable for any further similar activity in Russia. In

addition, if Ust-Tosno landfill is remediated as another pilot project proposal suggests, the need for leachate treatment would be of temporary nature.

### **1.2 Hazardous Waste Generation, Interim Storage and Disposal Inventory for Industrial Enterprises**

The only information available on hazardous waste formation in St Petersburg are the reports of the companies to Rostekhnadzor. The information does not appear very accurate (see inventory report), which may be due e.g. to incorrect classification of waste in enterprises and varying reporting discipline. Therefore the types and quantities of hazardous waste formed in enterprises in the region should be studied in detail.

The information will be crucial for hazardous waste management improvements, enforcement, treatment capacity development and for designing financial mechanisms to fund environmentally sound management. The study should be based on service, manufacturing and other industrial enterprises.

It has been estimated that the enterprises under federal supervision generate most of the hazardous waste in the region. These enterprises also report annually to Rostekhnadzor on the amounts and types of hazardous waste stored and formed. In addition to the reported information, some effort should be made to estimate hazardous waste generation in enterprises falling outside Rostekhnadzor reporting.

#### *Benefit to the Baltic Sea*

A comprehensive assessment of hazardous waste management practices requires more detailed information on waste formation. It is also a prerequisite for developing environmentally sound capacity for hazardous waste treatment and designing financial aspects of management. Thus, in the long run, reliable information on hazardous waste production would enable economically sound planning of hazardous waste management capacity and system, provided that the legislative and enforcement issues are in place.

#### *Time requirement for implementation*

6-12 months.

#### *Implementability*

Currently it appears that the project would be implementable only for oily waste, as no additional

information to the Rostekhnadzor reports is likely to be gathered on other waste types. The companies treating oily waste are registered by Rosprirodnadzor, and if that information was made available to the consultant some work could be carried out in that field.

### **1.3 Pilot Project for Separate Collection of Hazardous Waste**

The objective of the project is to study the possibilities of increasing collection rates and environmentally sound management of mercury-containing waste, WEEE, pharmaceutical waste and other types of hazardous waste. One of the key outcomes would be to study the amounts of hazardous waste produced by households currently being landfilled. This information, along with the environmentally sound management costs would be beneficial for organising separate collection sustainably in the future (e.g. how to cover the costs of the action).

St Petersburg has already initiated activities aimed at reducing the amount of hazardous waste landfilling. In December 2009, a mobile collection system, Ekomobil, was tested in Primorsky district with promising results. Ekomobil, however, only collects fluorescent lamps from households, which are subsequently destroyed at the EkoStroi facility. The BaltHazAr pilot project could complement the St Petersburg initiative by extending the collection to additional districts and also other hazardous waste types generated in households. These could include WEEE, waste oils, accumulators, batteries and pesticides. The pilot would also involve consideration related to environmentally sound management of such waste in the region.

The key partner in this pilot project would be a hazardous waste management company, which would be in charge of collection and management of waste in an environmentally sound manner. The company and the St Petersburg Environment Committee would receive support from BaltHazAr for equipment, personnel and awareness raising. It could also be taken into account that the City of Turku in Finland has already discussed the organisation of this activity with St Petersburg.

#### *Benefit to the Baltic Sea:*

Reduction in the amounts of hazardous substances currently disposed of in landfills for municipal solid waste (MSW) or which are discharged into the public sewage system. Removal of hazardous waste components from the MSW is required for environmentally sound thermal destruction of waste, which has been planned to be launched in St Petersburg. In addition, data on the quantities and types of hazardous waste formed in households currently being landfilled will be acquired.

#### *Time requirement for implementation*

The pilot collection period itself could be in total 6-9 months. The pilot project would start with training of staff (about three months). Public awareness raising would be enhanced as soon as the collection systems have been decided. The success and sustainability of the project largely depends on continuing support from the local authorities.

#### *Cost estimate*

- Truck container with necessary emergency preparedness equipment: 20 000 EUR;
- Truck: possibly using the same truck as in the St Petersburg pilot project;
- Training personnel: 10 000 EUR;
- Public awareness: 10 000 EUR;
- Disposal of hazardous waste collected: 20 000 EUR;
- Salaries and consumables: 20 000 EUR.

#### *Implementability*

The City of St Petersburg has already started piloting fluorescent lamps separate collection. The Environment Committee considers the proposed pilot project too small and intends to continue their own separate pilot collection of fluorescent lamps in 2010 despite the BaltHazAr actions. In the proposed pilot project, it is worth noting that collecting other types of hazardous waste (solvents, paints, accumulators, pesticides, etc.) than fluorescent lamps would require identification of new destruction technologies. In the long run, the pilot project would not be sustainable unless public funding was made available or a way to charge the costs from the public developed. This could, in principle, be carried out together with regular waste management costs.

### **1.4 Galvanic Waste Treatment**

#### *Goal*

The objective of this pilot project is to improve the treatment of galvanic waste containing heavy metals and cyanides. Wastewater from galvanic processes typically contains high concentrations of Zn, Ni, Pb, Cr, Sn and other metals. The foreseen treatment would be to precipitate and reuse the metals in galvanic waste that presently are disposed of at landfills.

## Background information

Galvanic waste (GW) treatment has been identified as a waste management problem in St Petersburg. Currently the waste from metal working facilities containing high amounts of heavy metals is mainly being disposed of in ponds at Krasny Bor (Figure 1) without any treatment. Some larger galvanic plants have their own waste water treatment plants and need no external collection.

Galvanic chemical plants (GCP) are one of the main sources of heavy metal (Cu, Cr, Ni, Zn, Cd, etc.) pollution of waters and soils in St Petersburg. The main toxic components of GCP are spent electrolytes and pickling solutions. Galvanic waste originates from preparation baths (degreasing and wet etching), surface treatment baths and rinsing baths. According to the information from the St Petersburg authorities, sludges are not a problem as they can be transported as such to Krasny Bor.

Currently St Petersburg enterprises lack a convenient, effective and economically reasonable treatment system for waste electrolytes and solutions. There are at least 40 companies that generate galvanic waste. Classes of hazard of galvanic waste are I (very hazardous), II and III. Earlier there were up to 400 plants in operation. The dramatic decrease in this quantity and changes in economics have weakened the collection and transportation system of this type of industrial waste, which may lead to inappropriate waste management practices (dumping, discharging of waste waters into the sewage system).

The only authorised and licensed disposal site for GCP waste in the North West of Russia is the Krasny Bor industrial waste landfill. Waste is deposited in lagoons without treatment, a process that does not meet modern environmental standards. Moreover, transportation of waste of high classes of hazard (I and II) also represents potential environmental risk. By reduction of galvanic waste volumes, lowering of their classes of hazard and introduction of recycling considerable environmental benefits can be achieved.

## Pilot proposal

The main idea of the pilot project would be to reduce the risk of galvanic waste entering the environment and to provide environmentally sound management of such waste.

- The project would include the following elements: Inventory of galvanic waste producers;
- Analysis of the presently used treatment techniques;



Figure 1. Satellite image of the Krasny Bor polygon showing the three ponds used for galvanic waste disposal (arrow) (image: Google Maps).

- Analyses of available technology to improve treatment; and
- Improvement of collection and treatment.

## Benefit to the Baltic Sea

Reduced risk of inappropriate management of galvanic waste and reduction of heavy metal and etching agent load onto the Baltic.

## Time requirement for implementation

The estimated time for inventory of galvanic waste generation and analysis of present and available new treatment technology is about 12-15 months.

## Cost estimate

- Background study: 30 000 – 50 000 EUR;
- Improving treatment:

In principle there are two foreseen options: stationary treatment at each enterprise or mobile treatment designed in St Petersburg. The rinsing solutions are fairly uniform by composition in all galvanic processes and could be treated relatively easily. Stationary solutions placed at metal plating enterprises cost approximately 150 000 EUR. However, it is not possible to estimate the technologies needed for treatment of bath solution without specific knowledge of the process.

- Indicative cost-estimate for the mobile solution is in the order of magnitude of 200 000 EUR.

## 1.5 Feasibility/Contamination Study for the Unauthorised Ust-Tosno Landfill

The 15 ha landfill located near the Krasny Bor hazardous waste polygon contains roughly 400 000 m<sup>3</sup> of waste. There is a ring channel immediately surrounding the landfill, which leads to the Bolshaya Izhorka River on the catchment of the Baltic Sea. The leachate from the landfill contains high amounts of Al, phenols, and oils, suggesting that hazardous waste have been placed on the landfill.

Before considering rehabilitation of the landfill, a study of the contamination would be necessary to identify the threat to the Baltic Sea. In this pilot project, the waters from the landfill would be analysed for hazardous substances to identify whether measures should be taken and possibly a rehabilitation plan developed.

### *Benefit to the Baltic Sea:*

Reduced load of hazardous substances from the old unauthorised landfill. Demonstration project on background study, planning rehabilitation and preparing the required technical description.

### *Time requirement for implementation*

9-12 months.

### *Cost estimate*

- The technical planning project organised by the Environment Committee of St Petersburg has been estimated to cost approximately 150 000 EUR;
- Rehabilitation of the landfill: indicative cost estimate is 1-5 million EUR.

## 2 LENINGRAD REGION

Pilot project proposals for Leningrad region (oblast, later LO) are:

- Hazardous waste generation, interim storage and disposal inventory for industrial enterprises;
- Treatment of mercury-containing-waste at Kirpichniy Zavod;
- Increasing collection rates and management of mercury-containing waste;
- Improvement of general hazardous waste collection.

Only Kirpichiy Zavod MCW treatment is supported by the LO authorities.

## 2.1 Hazardous Waste Generation, Interim Storage and Disposal Inventory for Industrial Enterprises

The objective is to study the types and quantities of hazardous waste formed in enterprises in Leningrad Oblast. The information will be crucial for hazardous waste management improvements, enforcement, treatment capacity development and designing financial mechanisms to fund environmentally sound management. The study should be based on service, manufacturing and other industrial enterprises.

It is likely that the enterprises under federal supervision generate most of the hazardous waste in the region, as in St Petersburg. These enterprises also report annually to Rostekhnadzor on the amounts and types of hazardous waste stored and formed. This information can be made available to the consultant. In addition to the reported information, some effort should be put into estimating hazardous waste production in enterprises falling outside Rostekhnadzor reporting.

### *Benefit to the Baltic Sea*

A comprehensive assessment of hazardous waste management practices requires more detailed information on waste formation. It is also a prerequisite for developing environmentally sound capacity for hazardous waste treatment and designing financial aspects of management. Thus, in the long run, reliable information on hazardous waste production would enable economically sound planning of hazardous waste management capacity and system, provided that the legislative and enforcement issues are in place.

### *Time requirement for implementation*

6–12 months.

### *Implementability*

This proposal was not supported by the local authorities.

## 2.2 Treatment of Mercury-Containing-Waste at Kirpichniy Zavod

### *Goal*

The goal of this pilot project is to assess and plan the potential reduction of the environmental threat caused by illegal storage of mercury-containing lamps in the



old industrial area of Kirpichniy Zavod (brickworks) in the Vsevolozhsky District of Leningrad Oblast.

#### *Background information*

Kirpichniy Zavod (Figures 2 and 3) is an old industrial facility area where used fluorescent lamps are stored illegally in an unfinished building. The lamps accumulated on the site between 1986 and 1993. The experts have estimated that in 2006 the amount of stored lamps exceeded one million, containing several kilograms of mercury (according to Russian information, a lamp may contain up to 80 mg Hg, which is high compared to the European 5 mg per lamp). The nearby unauthorised dump is polluted by mercury-containing lamps.

The Kamenka River is located at approximately one kilometre from the site and the Neva River at 15 km. The villages and Vsevolozhsk town in the surroundings of the mercury store are potentially within the zone of mercury exposure.

In 2006, the programme “Environmental Protection of Leningrad Oblast in 2007-2010” was approved. The work for removal and demercurisation of the stored luminous lamps was included in this programme. In four years about 250 000 euros have been allocated for the cleaning of mercury contamination and demercurisation of the used lamps. In 2007, about 300 000 lamps were removed and by the end of 2010 the whole lamp store is estimated to be emptied.

The soil around the storage building and the structures itself are likely to be contaminated by mercury. Contaminated soil has been remediated in connection with the LO project, but the methods used are not known to the consultant. The view of the local experts was that there is no need for mercury-contaminated soil remediation.

#### *Rationale for the pilot project*

Metallic mercury is easily volatile and toxic to humans and to the environment. It can be removed from the global cycle only by stabilisation as non-volatile sulphur compounds. This is carried out in the demercurisation process. By stabilisation the gaseous emissions as well as leaching of mercury to the environment can be prevented. To assess the need for remediation of constructions and, if needed, of the soil outside, the degree of contamination should be studied. The lamps should be destroyed. It is to be noted, however, that many mercury lamp destruction facilities in Russia do not stabilise mercury but recycle it to the mercury market.



Figure 2. Kirpichiy Zavod lamp storage.



Figure 3. The lamps have been piled inside the storage in four rooms.

#### *Pilot proposal*

The pilot proposal includes:

- Contamination study of constructions and if needed, of the soil in the brick factory area
- Environmentally sound destruction of mercury-containing lamps

#### *Potential risks*

- Costs of building materials remediation can be higher than estimated because no detailed inventory of structure contamination has been conducted.

#### *Benefits to the Baltic Sea*

Mercury contamination is a potential threat to the Baltic Sea. Demercurisation would lower the risk. The risk of mercury polluting the Baltic Sea is, however, relatively low.

#### *Time requirement for implementation*

4-6 months.

#### *Cost estimate*

100 000 EUR.

### **2.3 Increasing Collection Rates and Management of Mercury-Containing Waste**

As in St Petersburg, the fluorescent lamps and mercury-containing thermometers are treated as mercury-containing waste. However, the collection of lamps is at present the responsibility of the municipalities, and according to the oblast authorities the waste may be accumulating in cellars. Hence the public buildings such as schools as hospitals have accumulated a high amount of MCW (Mercury Containing Waste).

The project is a one-off effort to remove the accumulated MCW. The consultant will work together with the LO administration to identify a possible hazardous waste management company in the region.

#### *Benefit to the Baltic Sea:*

Reduction in the amounts of hazardous waste currently disposed of in landfills for Municipal Solid Waste (MSW) or led into the public sewage system. Removal of hazardous waste components from the MSW is required for environmentally sound treatment of waste. Data on the quantities and types of hazardous waste currently being landfilled will be acquired.

#### *Time requirement for implementation*

Estimated time required for implementation of project is about six months.

#### *Implementability*

This proposal was not supported by the local authorities.

### **2.4 Improvement of General Hazardous Waste Collection**

Private citizens and households are not provided with hazardous waste management services in LO. Hazardous waste from households, such as waste oils, WEEE, mercury-containing articles and batteries, are not collected separately from MSW and are consequently disposed of as regular solid waste in landfills. The situation should be improved, especially when it comes to potential MSW incineration in the future.

The objective of the project is to study the possibilities of increasing collection rates and environmentally sound management of WEEE, pharmaceutical waste and other types of hazardous waste.

The consultant will work together with the LO administration to identify a possible hazardous waste management company in the region. It would be beneficial to use the same company as in St Petersburg, if possible, to achieve synergy and avoid overlapping work. Considerable savings can be achieved in awareness raising by joint efforts.

It is foreseen that the pilot project could be carried out by initiating collection of WEEE, waste oil, accumulators, batteries and pesticides from households in a pilot district/city/suburb in Leningrad Oblast. Collection could be organised by establishing a mobile collecting point (such as Yrjö in Turku) or a collection point in co-operation with gas stations. The problem with the latter option is that hazardous waste collection would be considered as storage and the regulatory basis (i.e. permit conditions) is currently unclear.

The key partner in this pilot project would be a hazardous waste management company, which would be in charge of collection and management of waste in an environmentally sound manner. The company and the local authorities would receive support from BaltHazAr for equipment, personnel and awareness raising.

#### *Benefit to the Baltic Sea:*

Reduction in the amounts of hazardous substances currently disposed of at landfills for Municipal Solid Waste (MSW) or discharged into the public sewage system. Removal of hazardous waste components from the MSW is required for environmentally sound waste management. In addition, data on the quantities and types of hazardous waste formed in households and small enterprises currently being landfilled will be acquired.

#### *Time requirement for implementation*

12–15 months.

#### *Implementability*

This proposal was not supported by the local authorities.

## **3 KALININGRAD REGION**

Pilot project proposals for Kaliningrad Oblast are:



- Remediation of contaminated soil at the oil storage of the port of Kaliningrad and improvement of ballast water treatment;
- Improvement of mercury-containing waste management in Kaliningrad Oblast;
- Improvement of general hazardous waste collection;
- Leachate collection and treatment at one representative landfill.

These pilot project proposals are related to the two HELCOM hot spots located in Kaliningrad namely: 70 Kaliningrad Russia Kaliningrad Industry (hazardous waste) and 71 Kaliningrad Russia Oil Bunkering Station Industry.

### 3.1 Fuel Transfer Complex “Kaliningrad Sea Fish Port”

#### Goal

The goal of this pilot project is to cease leakage of oil hydrocarbons from contaminated soil in the fuel transfer complex, as well as to improve ballast water treatment. The port is located by the Prigolya River (Figure 4) and has direct flow connection to the Baltic Sea.

#### Background information

The fuel transfer complex practises the following main activities:

- trans-shipment of over 1.5 million tons per year of oil products, of which 80% is crude oil; and
- reception and treatment of ship hold and ballast tanks (about 14 000 m<sup>3</sup>/a) and other oil-containing water fractions.

The contamination of the site was investigated in 2000 by an expert company. According to their report the amount of oil-contaminated soil was estimated to be 19 000 m<sup>3</sup>. The shore line of the Prigolya River was largely classified as highly contaminated. The soil has become contaminated gradually during over sixty years of fuel-terminal activities.

Separation of oil from ballast water has been developed and several methods are used. The fuel transfer complex is currently the only enterprise in Kaliningrad Port that takes oily waters for treatment. The final residue of water treatment is a concentrated tar-like oil sludge containing heavy oil. Presently this



Figure 4. Satellite image of the Kaliningrad fuel transfer complex showing the oil unloading quay (right) and the tar pond (left).

tar is stored in an open pond (cf. Fig. 4), but treatment of this sludge by stabilisation and by incineration has been developed and tested. At the time of the site visit (17.7.2009) oil was leaching from the soil to the Pregolja River and further to the Vistula Lagoon that has access to the Baltic Sea. The seeping oil was removed from the water in front of the quays with oil booms. Soil contamination has not been investigated in detail and the extent of contamination is not known. The investigation report of 2000 has not been available to the consultants for review for this pilot proposal. Measures for remediation of the oil-contaminated soil have been called for several times but the costs have been too high for the enterprise.

The sources of oil to the Pregolya River are contaminated soil and discharge of treated process sewage (about 230 m<sup>3</sup>/d). The treatment plant is working as an enterprise since 1976. The enterprise operates the water treatment plant (German Baker Process) since 2007 and the sludge disposal pond. The efficiency of the treatment plant is insufficient and does not meet the local hygienic norms.

This site belongs to HELCOM's "hot spots" (hot spot number 71) of sites that pollute the Baltic Sea with harmful substances.

#### Rationale for the pilot

The pilot project would focus on remediation of oil-contaminated soil and of the oil sludge pond, as well as on improvement of the treatment facility for oily waters. Soil remediation would start in the most urgent areas concerning access of oil to the Prigolya River. The enterprise has taken measures to prevent additional contamination of soil by spills and reduced the amount of oil in treated sewage discharged to the river. The

present level and extent of oil in the soil is so high that it remains a continuous source of oil to the river. The fuel transfer complex is mentioned as the main source of oil contamination of the Pregolya River. Based on previous investigations, the maximum concentration of oil in the soil is about 10% (100 g/kg) and the average contamination approximately 40 g/kg.

#### *Pilot proposal*

The pilot proposal includes three phases:

Phase I: Review of previous soil investigations, detailed further investigation of soil contamination with sampling and laboratory analysis. Remediation of the oil sludge pond (800 m<sup>3</sup>);

Phase II: Choosing of method(s) for remediation of contaminated soil and planning of contaminated soil remediation;

Phase III: Contaminated soil remediation and improvement of present ballast water treatment techniques and facility.

#### *Indicative cost estimate*

The costs of the pilot project would require external financing (HELCOM and other sources) and own financing by the fuel transfer complex (not yet officially confirmed by the company). The costs of remediation are dependent on the selected remediation techniques and can be assessed accurately only after Phase I complementary investigations and Phase II selection of remediation methods.

Indicative cost estimate for external financing is:

- Phase I soil investigations: 50 000 – 90 000 EUR;
- Phase II remediation planning: 60 000 – 120 000 EUR;
- Phases I, II and III in total: more than 1 million EUR.

It is proposed that the fuel transfer complex would cover the costs of sludge storage remediation, improvement of present treatment facilities and monitoring of discharged water.

#### *Benefits to the Baltic Sea*

Remediation of the fuel terminal would decrease hydrocarbon loading of the Pregolya River and the Baltic Sea and likely remove the site from HELCOM's list of priority hot spots.

#### *Time requirement for implementation*

Stage I: six months

Stages I to III in total up to three years.

### **3.2 Improvement of Mercury-Containing Waste Management in Kaliningrad Oblast (by Eco-Centre Ltd)**

This pilot project was developed by Russian consultants Eco-Centre Ltd. The views of the working group in Kaliningrad, the EU consultant Pöyry Finland Oy and Finnish Environment Institute were taken into account.

#### *Goal*

Decrease of mercury compound pollution by collection and treatment of municipal mercury-containing waste (MCW).

#### *Background information*

There are no facilities for treatment and treatment of hazard class I-III wastes or sites for their environmentally friendly disposal in Kaliningrad Oblast except for oil-containing waste. Mercury-containing waste, which is hazard class I waste, is generated by enterprises, municipal institutions and households. According to the data of Rostekhnadzor, the volume of MCW generated by enterprises that report annually on the volume and composition of produced wastes is 30 metric tons per year. Municipal MCW, which is waste generated by municipal institutions (schools, hospitals, public buildings of different ownership and departmental membership) and household MCW are not taken into account.

Presently the collection of MCW from municipal institutions (mainly mercury-containing lamps) is quite satisfactorily arranged only in Kaliningrad City although MCW generated by households ends up in landfills in the mixture of MSW (municipal solid wastes). Landfills (dumps) of MSW in Kaliningrad Oblast do not meet the environmental and sanitary requirements being thus sources of pollution to the oblast and to the Baltic Sea. They do not have an underlying waterproof layer or system of leachate collection and treatment, which is why the filtrate pollutes surface and groundwater, and finally the Baltic Sea with hazardous substances, including mercury compounds.

Only one enterprise in Kaliningrad Oblast, OOO Syntez Ltd, practises treatment and utilisation of MCW. The enterprise has been working since 1989. Since 1992 it has been collecting different kinds of mercury-containing waste (all kinds of lamps, mercury

containing devices). The enterprise has an area of about 1 ha in an industrial zone in the northern outskirts of Kaliningrad. The production facilities comprise:

- administrative building - one-floor building 6 x 8 m<sup>2</sup>;
- industrial building – metal shed with open storage of luminous lamps on shelves; and an isolated room with a treatment unit for luminophor extraction.

Syntez Ltd uses the electric system of the adjacent enterprise. Allowed electric load is 25 A/hour. The lack of reserves for electric capacity limits the expansion of the present demercurisation process.

From 1992 to 1996 the enterprise used a plant, URL-2M, whose final product was metallic mercury. The mercury obtained from the treatment of MCW was transferred for storage in the laboratory of the Department of GO ChC of Kaliningrad Oblast.

Since 1996 the enterprise has been using the plant designed by the enterprise. The technology of MCW treatment is based on mechanical separation (shake table) of metal caps, glass and luminophor. The plant is certificated.

The end products of the MCW treatment are:

- metal caps (hazard class IV) – transferred to be used as recyclable materials;
- glass breakage (hazard class III) – buried in the landfill of Kruglovo;
- mercury-containing luminophor contaminated with glass dust – stored at the enterprise.

Mercury vapours are recovered from the demercurisation unit by vacuum and adsorbed in cloth filters.

Mercury is not utilised in the Oblast. Before 2000 mercury was removed in Krasny Bor. Now mercury is being accumulated at Syntez Ltd and the laboratory of GO ChS.

By the end of 2009, in the area of OOO Syntez Ltd, 12 metric tons of luminophor had accumulated during previous years. One ton of luminophor contains 2 kg of mercury; therefore, the accumulated luminophor contains 24 kg of mercury.

The treatment capacity of the plant used by OOO Syntez Ltd is 250 000 lamps per year. The plant is not using its full capacity. 200 000 lamps were processed

in 2007, 145 000 in 2008, and about 90 000 lamps had been collected and processed by the end of 2009. The decreasing volume of treatment is not caused by a decrease in the consumption of mercury-containing materials and equipment but rather by the high tariffs for treatment of MCW. The cost of transportation from the place of its generation to Kaliningrad increases the cost of utilisation for consumers.

The main mass of MCW is generated in Kaliningrad City and its suburbs.

The present demercurisation process in KO is not environmentally sound because the end product of mercury remains class I HW. The capacity is also too low to treat all used mercuric lamps produced in KO. The purpose of the pilot project is to find a modern technology (compatible with BAT) with capacity to treat all used lamps in KO. The location of the new demercurisation unit should be based on mercuric waste inventory, logistics, economy and appropriate infrastructure of the site, including availability of electricity.

About 600-700 enterprises use the services of OOO Syntez Ltd, of which 70% deliver the waste themselves, while the transportation from the others is provided by "Syntez Ltd".

Syntez Ltd has a municipal contract within which it collects MCW generated by municipal institutions of Kaliningrad (schools, kindergartens, hospitals). About 25 000 lamps are collected from municipal institutions annually. Removal takes place every three months.

The last contract for collection of MCW from municipal institutions in Kaliningrad Oblast financed by the oblast budget was signed in 2005. Within this contract about 30 000 lamps were collected from all municipal institutions of Kaliningrad Oblast (excluding Kaliningrad City).

Because of lack of financing, municipal MCW is now collected inefficiently in Kaliningrad Oblast. The organisation and financing of mercuric lamps collection is the task of municipalities and it should be developed by responsible organisations.

Some municipalities (Chernyakhovsk, Sovetsk and Svetly) have signed contracts with Syntez Ltd for the treatment of municipal MCW. Some municipal institutions have signed direct contracts with the company for the utilisation of MCW (for example, kindergartens which can get money from parents). As a result of the absence of financing, the amount of waste collection from municipal organizations in the oblast has been reduced to 5 000 lamps per year.

After information about the company was published in the media, requests for the removal of mercury lamps from citizens have arisen. However, uncoordinated requests and lack of financing of MCW collection from households do not provide for profitable collection and treatment of this waste.

According to the data of Syntez Ltd, the annual volume of sales of power-saving lamps is about 120 000 lamps per year. The consumption of mercury lamps is expected to increase in the near future because the production of incandescent lamps is now being reduced. Moreover, according to the Federal Law "On energy savings..." passed in November, 2009, their sale in the RF will end by the year 2014. It means that by 2014 households will be using only mercury lamps. Therefore, the prevention of the entry of household mercuric lamps in landfills is a timely and urgent task.

Within this project the generation of MCW in KO will be assessed. The treatment option will be analysed and a strategy developed containing activities targeted to ensure the environmentally sound collection and treatment (BAT-compatible) of Hg waste. Collection of MCW from households will be demonstrated in one pilot district. The location, treatment method and equipment of MCW will be recommended as the final phase based on the PP results.

### *Summary*

- The only one enterprise, Syntez Ltd, which is at present the only operator in this area, practises treatment and utilization of MCW in Kaliningrad Oblast;
- The technology applied by Syntez Ltd is not modern and does not provide proper ecological and occupational safety because the result of the treatment still contains mercury (metallic Hg) which requires Class I Hazardous Waste disposal or extraction of metallic Hg for reuse.
- However, current technology provides a decrease in the volume of MCW and control over its accumulation and storage.
- Resources for the technical re-equipment and modernisation of the production of Syntez Ltd are lacking, mainly because of insufficient electric energy available.
- Collection and treatment of municipal MCW is organised only for municipal institutions in the city of Kaliningrad; MCW of the other municipalities is mainly accumulated at the places of their generation or enter the landfills in MSW.
- The volume of generation of MCW in Kaliningrad Oblast is slightly higher than that in Kaliningrad City (30 thousand and 25 thousand lamps per year, respectively).
- MCW from households go to the landfills of MSW from where metallic mercury can be released mainly by evaporation to the atmosphere, but also to some extent in leachate.
- Based on federal waste statistics, the MCW (mercury lamps) from enterprises is about 30 tonnes annually.
- Regional authorities do not have trustworthy data on the amount of unaccounted MCW including that from households in Kaliningrad Oblast.
- The amount of MCW generated by households is expected to grow because of cutting down of the turnover of incandescent lamps and switching to mercury power-saving lamps due to the enforcement of the Federal Law of the RF "On energy-savings".
- Resources for sustainable final disposal of products of MCW treatment (luminophor in current technology) are absent in KO. The only method for their utilisation in the current situation is to transfer these products to the special landfill "Krasny Bor" in Leningrad Oblast for disposal. However, this option is likely not accepted in LO at present. For this reason, the pilot project aims at finding a demercurisation process that transforms metallic Hg into a stable and safe product, i.e. mercuric sulphide.

### *Tasks*

This pilot project proposal is related to the improvement of treatment of mercury containing waste (used lamps and thermometer) in the Kaliningrad region.

The pilot project can be divided into four parts:

- Assessment of amounts of MCW generated and treatment capacity in KO;
- Arrangement of a system of MCW collection from the population and municipal institutions in the pilot municipalities;
- Elaboration of the Regional Programme of measures for MCW;
- Improvement of technical resources for MCW deactivation in Kaliningrad Oblast.



- Activity 1. Assessment of MCW generation and management
  - Assessment, analysis and forecast of volumes of MCW generation in Kaliningrad Oblast (Activity 2 will also provide information on the generation of MCW);
  - Assessment of the current technical resources for MCW deactivation in Kaliningrad Oblast.

This is a two-phased activity. In the first phase, the volumes of formation of mercury-containing waste in industry and households is estimated. Also, Activity 2 will provide information on the generation of MCW waste in households and municipal institutions. In the second phase, the need for improvements and changes in the present treatment practice is evaluated.

#### Activity 2. Creating strategy and plans for improvements

- Public awareness raising;
- Arrangement of a system of MCW collection from households and municipal institutions in the pilot municipalities (one urban settlement and one rural district containing several villages are planned as pilot municipalities);
- Testing of the example of pilot municipality organisational-financial mechanisms and technology for separate collection and deactivation of hazardous wastes from households.

The objective of the project is to study the possibilities of setting up a collection mechanism in a pilot district in order to make environmentally sound management of mercury-containing waste possible. This is closely linked with Activity 1 “Assessment of MCW generation and management”. It is foreseen that the activity could be carried out by initiating collection of mercury-containing waste (fluorescent energy-saving lamps, Hg thermometers) in a pilot district. Temporary storages for discarded luminescent tubes should be organised in a pilot district in Kaliningrad Oblast, as well as transportation from temporary storages to the demercurisation facility.

#### Activity 3. Elaboration of the Regional Programme of measures for collection, deactivation and utilisation of MCW from households and municipal institutions.

- Based on Activities 1 and 2, a regional programme of measures for collection, treatment and utilisation of MCW from households and municipal institutions is developed in close co-operation with the regional and municipal authorities in KO.

- Activity 4. Improvement of technical resources for MCW treatment in Kaliningrad Oblast, potential investments based on Activities 1-3.
  - An evaluation of the most appropriate solution for enhancement of MCW treatment in KO is made as a basis for a possible decision on the establishment of a new installation for demercurisation/upgrading of existing MCW technologies. Treatment capacity will be increased or existing technology improved, if needed, based on the findings of Activities 1-3.

#### Main participants in the project:

- The government of Kaliningrad Oblast will probably be presented by the work group of the BaltHazAr Project;
- Administration of the pilot municipalities;
- Enterprises practising transportation and deactivation of wastes;
- Depending on the results of the analysis – Administration of municipality where additional equipment for deactivation of MCW may be set.

#### Summary of the activities within the project:

- Study of current and forecast of future volumes of generation and flows of MCW in Kaliningrad Oblast;
- Public awareness raising;
- Study of MCW management capacity;
- Finding out places for optimal setting of equipment for MCW deactivation taking into account current and future volumes and routes of transportation;
- Elaboration of the Regional Programme of measures for collection, treatment and utilisation of MCW from households and municipal institutions;
- Equipment of sites for MCW collection units in the pilot municipalities;
- Arrangement of a system of MCW collection in the pilot municipalities;
- Transportation and treatment of MCW collected;
- Putting into operation additional equipment for MCW treatment depending on the results of the project;



- Analysis of information on the project implementation and results, including sustainability;
- Organisational support of the project – obtaining of necessary permits, elaboration of drafts of standard-legal acts at regional and local levels, co-ordination of activities in details with the main participants of the project;
- Dissemination of the project results for the North-West Region of Russia.

#### Expected project results:

- Getting trustworthy information and forecast of volumes of MCW generation in Kaliningrad Oblast;
- Analysis of MCW management;
- The Regional Programme of measures for collection, deactivation and utilisation of MCW from households and municipal institutions;
- Developing separate collection of MCW from the mixture of MSW in the pilot municipality;
- Involving the population in separate collection of MCW;
- Recommendations on MCW treatment and arrangement of MCW flows in Kaliningrad Oblast;
- Technical equipment of an MCW treatment facility in KO;
- Awareness of the municipalities in the Baltic Sea Region of the RF (Kaliningrad Oblast, Karelia, Saint Petersburg, and Leningrad Oblast) of the realisation and project results.

#### Potential risks:

- Absence of a site for environmentally sound setting of equipment for MCW treatment. In this case, no purchase of equipment will not be made; the project will be limited to the arrangement of a system of MCW collection in the pilot municipality and the spread of this experience.
- Lack of financing for treatment of the MCW collected within the project. There are no other sources of financing that could be proposed, except for federal, oblast and local budgets. The government of the RF has started to create a system for financing the treatment of mercury-containing lamps. The stability of the project greatly depends on the accomplishment of this

initiative.

#### *Benefits to the Baltic Sea*

A decrease in mercury pollution of the environment as a result of the removal of MCW from the mixture of MSW. The removal of mercury from waste sites and landfills will improve the quality of leachate and decrease the release of gaseous mercury from landfills.

#### *Indicative cost estimate*

	BaltHazAr EUR	Co-financing EUR
Activity 1	30 000	0
Activity 2	25 000	20 000
Activity 3	25 000	3 000
Activity 4	25 000 / 460 000	30 000
Project management	15 000 / 10 000	
Total		
Activities 1-3 <sup>1</sup>	95 000	23 000
Activity 4 <sup>1</sup>	35 / 470 000	30 000
<b>Total</b>	<b>130 000 / 555 000</b>	<b>53 000</b>

<sup>1</sup> Including project management

### **3.3 Improvement of General Hazardous Waste Collection**

#### *Goal*

The goal of this pilot project is to remove hazardous wastes (classes I to III) from landfills and reduce leakage of these compounds in landfill leachate to the environment. This pilot project proposal is linked to the pilot proposal "improvement of mercury-containing waste management in Kaliningrad Oblast".

#### *Background information*

Private citizens and households are not provided with hazardous waste management services in KO. Hazardous waste from households, such as waste oils, WEEE, mercury-containing articles and batteries are not separately collected from MSW and are consequently disposed of as regular solid waste in landfills. The situation should be improved.

#### *Pilot proposal*

The objective of the project is to study the possibilities of increasing collection rates and the environmentally sound management of WEEE, pharmaceutical waste and other types of hazardous waste.

It is foreseen that the pilot project could be carried out by initiating collection of WEEE, waste oil, accumulators,

batteries and pesticides from households in a pilot district/city/suburb in Kaliningrad Oblast. Collection could be organised by establishing a mobile collecting point (such as Yrjö in Turku) or a collection point in co-operation with gas stations. The problem with the latter option is that hazardous waste collection would be considered as storage and the regulatory basis (i.e. permit conditions) is currently unclear. The pilot proposal includes establishment of temporary storages for hazardous waste because currently the capacity to treat hazardous wastes in Kaliningrad Oblast is limited.

The key partner in this pilot project would be a hazardous waste management company, which would be in charge of collection and temporary storage of waste in an environmentally sound manner. The company and the local authorities would receive support from BaltHazAr for equipment, personnel and awareness raising.

The consultant will work together with the KO administration to identify a potential hazardous waste management company/companies in the region that would be willing to participate in this pilot. Public awareness raising is an important part of the pilot project and prerequisite for the success of the work.

#### *Benefit to the Baltic Sea*

Reduction in the amounts of hazardous waste currently disposed of in landfills for Municipal Solid Waste (MSW) or led into the public sewage system. Removal of hazardous waste components from the MSW is required for environmentally sound management of waste.

#### *Time requirement for implementation*

The estimated time required for implementation is about 12-15 months.

### **3.4 Landfill Leachate Reduction, Collection and Treatment**

#### *Goal*

The goal of this pilot project is to decrease the flow of harmful chemicals in landfill leachate to the environment and finally to the Baltic Sea.

#### *Background information*

Collection and treatment of landfill leachate is not properly organised at any of the KO landfills. The leachate contains toxic and hazardous compounds that have negative effects on the Baltic Sea ecosystem. Many of the major landfills in KO are located close to

the rivers that are in flow connection to the Baltic Sea.

#### *Pilot proposal*

One of the priority landfills identified in the project could be selected as demonstration project. In the selection, attention should be paid to the leachate analysis results from 2009.

In the pilot project, the volume of landfill leachate is estimated and the composition of hazardous compounds in leachate are investigated. The most effective action to reduce the impact of hazardous substance leachate on the Baltic Sea is to reduce the amount of waters that gets into contact with waste. For this purpose a feasibility study for the landfill operations would be recommended comprising:

- a plan for waste filling;
- precovering;
- closing of parts of the landfill gradually during the operation;
- leachate collection in a controlled way; and
- leachate treatment.

The aim for the filling plan and precovering is to keep the open waste fill area as small as possible and to keep clean rain water away from waste. The amount of leachate can be reduced more effectively by closing some parts of the landfill gradually than by precovering. The costs of closing the landfill would also be distributed over a longer period. A tailored guidance document for leachate-minimising landfill operations could be developed during this demonstration project, and this guidance document could also be applied in other landfills in Russia as need be.

Leachate collection can be carried out by open trench, underdrain around the landfill and structures that prevent leachate runoff. The leachate treatment depends on the substances in the leachate and will be chosen based on its quality which will be studied as the first action of the pilot case. The minimum treatment of leachate is clarification and equalising of water flow by sedimentation and oil removal. Solids and contaminants attached to solid materials can be removed by clarification.

#### *Benefit to the Baltic Sea*

The benefit of this project to the Baltic Sea is a reduced amounts of leachate and dissolved hazardous substances from a landfill to the Baltic Sea. Once a

conceptual solution has been developed in this pilot project, the same principles can be applied in other similar cases. The proposal guidance document is intended to facilitate this replication of the concept.

*Time requirement for implementation*

The required time for implementation of lechate collection and treatment is estimated to be 12-15 months. Actions needed are a feasibility study, construction design, selection of contractor, construction and commissioning.

## 4 SUMMARY OF PILOT PROPOSALS

Table 1 presents a summary of the pilot proposals with indicative cost estimate, implementation time and information on support by the local authorities.

Name of pilot proposal	Brief project description	Summary of benefits to the Baltic Sea <sup>1</sup>	High priority and/or support by local authorities	Sustainability Repeatability	Indicative cost EUR <sup>2</sup>	Time requirement
<b>City of St Petersburg</b>						
1. Landfill leachate reduction, collection and treatment of one selected representative landfill	Demonstrating construction of a leachate collection system from a closed/active landfill and treatment of leachate. Demonstrates also good operating management of a landfill.	High amounts of hazardous substances are transported from landfills to the Baltic Sea due to untreated leachate. Reduces discharges to the Baltic Sea directly.	No	Requires commitment from landfill owner/authorities. Repeatable.	** - ***	12 - 15 months
2. Hazardous waste (HW) generation, interim storage and disposal inventory for industrial enterprises	Comprehensive inventory of hazardous waste formation (types and amounts)	Indirectly contributes to the improved hazardous waste management planning and reduces need for disposal to landfills	Yes (for oily waste)	One-off task. Repeatable model	*	6 – 12 months
3. Hazardous waste separate collection in a pilot district	Collection of hazardous waste from households in a typical pilot district using mobile collection	Indirectly contributes to the improved hazardous waste management and less landfilling, also to HW inventory above	No	Sustainable if local support available Repeatable model	* - **	9 - 12 months
4. Galvanic waste treatment	Improving treatment of galvanic waste in St Petersburg metal working companies	High impact. At present no treatment exists, all either landfilled in KB or disposed of among sewage	Yes	Depends on charges and their use Repeatable	* - **	12 – 15 months
5. Feasibility / contamination study for remediation of unauthorised Ust-Tosno landfill	Feasibility study for landfill rehabilitation (technical description)	Demonstrating planning of rehabilitation, contamination study and environmental pollution	Yes	One-off, Repeatable model	* - **	9 – 12 months
<b>Leningrad Oblast</b>						
6. Hazardous waste generation, interim storage and disposal inventory for industrial enterprises	Comprehensive inventory of hazardous waste formation (types and amounts)	Indirectly contributes to the improved hazardous waste management and less landfilling	No	One-off task. Repeatable model	*	6 – 12 months
7. Kirpichnyy Zavod – treatment of mercury lamps	Environmentally sound disposal of mercury containing lamps disposed of at an old industrial site, and mercury contamination study of the buildings.	Low. Indirectly reduces Hg atmospheric emissions.	Yes (class A)	One-off project	*	4 – 6 months
8. Increasing collection rates and management of mercury containing waste	Removal of mercury containing lamps stored in municipal facilities of LO	Low. Indirectly reduces mercury emissions to atmosphere	No	One-off project Not repeatable	*	6 months
9. Improvement of general hazardous waste collection in a pilot district	Collection of hazardous waste from households in a pilot district using mobile collection	Indirectly contributes to the improved hazardous waste management and less landfilling, also to HW inventory above	No	Sustainable if local support available Repeatable model	* - **	12 - 15 months
<b>Kaliningrad Oblast</b>						
10. Remediation of contaminated soil at the oil storage of port of Kaliningrad	Clean up of heavily oil contaminated Fuel-transfer Port soil, improvement of ballast water treatment.	Continuous leakage of oil to the river and to the BS can be stopped, improvement of ballast water treatment unit (waste-water currently contains low concentration of oil).	Yes (class A)	One-off project Sustainable concerning ballast water treatment	***	in three phases up to 3 years
11. Improvement of Mercury-Containing-Waste Management in Kaliningrad Region	Inventory, assessment of current treatment and improved treatment of mercury containing waste in Kaliningrad Oblast.	Low. Indirectly reduces mercury emissions to the atmosphere and mercury concentration in landfill leachate.	Yes (class A)	Sustainable if local support is available Repeatable model	* - ***	12 - 18 months
12. Improvement of general hazardous waste collection	Collection of hazardous waste from households. Establishment of temporary storages for hazardous waste. <sup>3</sup>	Indirectly contributes to the improved hazardous waste management and less landfilling.	No	Sustainable Repeatable.	* - **	12 – 15 months
13. Landfill leachate reduction, collection and treatment of one selected representative landfill	Demonstrating construction of a leachate collection system from a closed/active landfill and treatment of leachate.	High amounts of hazardous substances are transported from landfills to the Baltic Sea due to untreated leachate. Reduces discharges to BS directly.	No	Requires commitment from landfill owner/authorities. Repeatable.	** - ***	12 – 15 months

<sup>1</sup> Low / Medium / High

<sup>2</sup> \* = up to 100 000EUR; \*\* = 100 000 – 500 000 EUR, \*\*\* = more than 500 000 EUR

<sup>3</sup> The meaningfulness of this pilot proposal is reduced by the fact that there is only limited treatment capacity for hazardous waste in Kaliningrad region.



**Helsinki Commission**  
**(Baltic Marine Environment Protection Commission)**  
*Katajanokanlaituri 6 B, 00160 Helsinki*  
*Phone: +358-207-412 649; Fax: +358-207-412 645*  
*[www.helcom.fi](http://www.helcom.fi)*

**Saint-Petersburg Public Organization**  
**"Ecology and Business"**  
*Post office box 66, RU-197342 St. Petersburg, Russia*  
*Phone: +7-812-430 6860; Fax: +7-812-430 9305;*  
*[www.helcom.ru](http://www.helcom.ru)*